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ACCESSIBILITY, AFFORDABILITY, AND FLEXIBILITY:
THE RELATIONSHIP OF SELECTED STATE SOCIOPOLITICAL FACTORS AND
THE PARTICIPATION OF ADULTS IN PUBLIC TWO-YEAR COLLEGES

By

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Accessibility, Affordability, and Flexibility: The Relationship of Selected State Sociopolitical Factors and the Participation of Adults in Public Two-Year Colleges

Chairperson: William P. McCaw, Ed.D.

This non-experimental, quantitative study examined the extent selected state sociopolitical factors relate to adult participation in public two-year colleges, and assessed how Montana compares to those states enrolling the most adult students. Utilizing archived data from the National Center for Education Statistics' (NCES) Integrated Post-Secondary Education Data System (IPEDS), the US Census Bureau's American Community Survey, and the National Association of State Grant and Aid Programs (NASSGAP) annual survey, a cross-sectional sampling for the United States from 2003, 2005, and 2007 was analyzed to examine how eight sociopolitical factors (independent variables) influenced adult participation (dependent variable) in public two-year colleges. Sociopolitical factors included: the institutional density of two-year colleges; the percent of public two-year colleges; the number of public two-year colleges with open admissions policies; the number of public two-year colleges that provide distance learning; the number of public two-year colleges that provide the opportunity to earn credit for prior experience; the economic incentive of a two-year degree; two-year college affordability; and the availability of state funded need-based financial aid.

Two forms of regression analyses were employed; standard multiple regression, and stepwise multiple regression. Standard multiple regression was used to identify the individual predictive influence each sociopolitical factor had on adult participation. Stepwise multiple regression was used to assess which combination of sociopolitical factors had the greatest ability to predict adult participation. Both analyses found the percent of two-year colleges, two-year college affordability, the availability of need-based aid, and the prevalence of distance learning to be the factors most influential in predicting the variation in the adult participation rate. In concert, the stepwise analyses found these factors to have twice the influence on adult participation than when each factor was considered individually. Descriptive statistics for these variables were examined to compare Montana to those states enrolling the most adult students. Montana compared well in the percent of two-year colleges, but falls below the high participation states on the other three factors. Implications of these findings on state and national policy are discussed.

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Greek Poet Constantine Peter Cavafy quipped, “When you set out on your journey to Ithaca, pray that the road is long, full of adventure, and full of knowledge.” My Ithaca is embodied in the following pages of this dissertation. I take solace in the fact that indeed this journey was arduous, adventuresome, and rewarding. While the culmination of my passage through this journey is captured within this research, the most meaningful yields of the process were gained along the way. Those accomplishments are not mine alone, nor were they achieved in isolation. Numerous individuals contributed to my learning, and ultimately my success as a student, researcher and scholar. I would like to take this opportunity to thank them.

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TABLE OF CONTENTS

CHAPTER ONE INTRODUCTION TO THE STUDY	1
Introduction	1
Statement of the Problem	2
Purpose of the Study	5
Why Adults.....	6
Why Public Two-Year Colleges.....	8
Research Question and Hypotheses	11
Research Question One	11
Research Question Two	12
Research Question Three	12
Definitions of Terms	12
Delimitations	15
Limitations.....	16
Significance of the Study	17
Summary	19
CHAPTER TWO REVIEW OF THE LITERATURE.....	21
Introduction	21
Why Adults Participate in Higher Education	22
Why Adults Don't Participate in Higher Education	32
Research on the Factors Influencing Adult Participation.....	41
Influence of Local Two-Year Colleges.....	42
Influence of Open Admissions Policy	43
Influence of Distance Learning	45
Influence of Experiential Learning Opportunities	47
Influence of Economic Impact	49
Influence of Tuition and Fees.....	51
Influence of Need-Based Aid	53
Summary	56
CHAPTER THREE METHODOLOGY	58
Introduction	58

Research Design	58
Unit of Analysis	59
Dependent Variable	60
Independent Variables.....	60
Confounding Variables	61
Research Questions and Hypotheses.....	62
Research Question One	63
Research Question Two	63
Research Question Three	63
Census	73
Data Collection Procedures	74
American Community Survey	76
NCES Digest of Education Statistics	76
IPEDS Fall Enrollment Survey	77
NASSGAP Annual Survey.....	78
Data Analysis.....	79
Summary	88
CHAPTER FOUR FINDINGS	90
Introduction	90
Preliminary Analysis	90
Research Question One	97
Research Question Two	104
Research Question Three.....	108
Summary	112
CHAPTER FIVE CONCLUSION	114
Introduction	114
The Research Questions	114
Findings and Implications	116
Influence of Local Two-Year Colleges.....	117
Influence of Open Admission Policy	118
Influence of Distance Learning	118

Influence of the Opportunity to Earn Credit for Prior Experience	119
The Economic Incentive of a Two-Year Degree.....	120
Influence of Two-Year College Affordability.....	121
Influence of the Need-Based Financial Aid	122
Recommendations	124
Recommendations for National Policy Makers.....	125
Recommendations for State Education Policy Makers and Governing Entities	126
Recommendations for Montana.....	127
Recommendations for Entities Responsible for Data Systems and Research.....	132
Suggestions for Further Research	134
Summary and Conclusion	136
References	138

LIST OF TABLES AND FIGURES

Tables

Table 1: Motivational Factors Related to Adult Participation in Higher Education	27
Table 2: Motivations for Adult Participation in Learning (Cross, 1981)	28
Table 3: Organization of Factors for Literature Review	42
Table 4: Research Variables and Data Source(s)	75
Table 5: Descriptive Statistics	91
Table 6: Tests of Normality	92
Table 7: Data Transformation Methods	95
Table 8: Tests of Normality on Transformed Variables	96
Table 9: Pearson r Correlation Values Measured Against Adult Participation Rate	98
Table 10: Standard Multiple Regression Model Summary	101
Table 11: ANOVA Results of Standard Multiple Regression Model	101
Table 12: Summary of Standard Multiple Regression for Variables Predicting Adult Participation Rate	102
Table 13: Stepwise Multiple Regression Model Summary	105
Table 14: ANOVA Results of Stepwise Multiple Regression Models	106
Table 15: Summary of Stepwise Multiple Regression for Variables Predicting Adult Participation Rate	106
Table 16: Squared Value of Semipartial Correlation Coefficients by Model	109
Table 17: High Participation States	110
Table 18: Comparison of High Participation States and Montana	111

Figures

Figure 1: Conceptual Framework of the Study	81
Figure 2: Data Analysis Models	86
Figure 3: Histograms of Variable Data	93
Figure 4: Normal Probability Plot of Regression Standardized Residual	99

CHAPTER ONE

INTRODUCTION TO THE STUDY

Introduction

America may be facing the perfect storm. In early 2007, the country began a treacherous plummet into a recession unlike any witnessed since the Great Depression of 1929 (Temin, 2010). As a result, unemployment rates rose to record levels (US Department of Labor, 2009) and many individuals are looking to higher education as a beacon of hope for a new future (Fry, 2009). President Barack Obama responded by announcing his American Graduation Initiative, pledging billions of dollars to community colleges for innovations in programming, facilities renovations and construction, and practices leading toward increased efficiency and effectiveness in educating the public (The White House, 2009). He called out to select groups to go back to college, and has encouraged the entire nation to strive for at least one year of post-secondary education. He asserted that America must educate its way out of the recession. His goal was to ensure by 2020 America once again has the highest proportion of college graduates in the world, and he called for five million more community college graduates in the next decade (The White House, 2009).

Even with the economically-depressed condition of the country, many agree that by the year 2015 there will be more jobs available in America than there will be qualified people to fill them (US Department of Labor, 2008). The majority of these positions will require some form of post-secondary education or training, much of which will occur in two-year colleges (Milano, Reed, & Weinstein Jr., 2009). Some researchers suggest that certificates and two-year degrees will be in the highest demand in the future (Handel,

2005). Unfortunately, participation in college in the United States has not increased significantly since the 1990s (National Center for Public Policy and Higher Education, 2008a). Although America ranks fifth among developed nations in overall participation rates in post-secondary education, it has failed to increase that rate while competing countries have continued to do so (National Center for Public Policy and Higher Education, 2008a). Complicating matters further, the cost of participation in college continues to rise in America while the availability of need-based aid continues to decline (National Center for Public Policy and Higher Education, 2008a).

Since the founding of the first community college at Joliet, Illinois in 1901, two-year colleges have become the gateway to post-secondary education and training for the vast majority of Americans (Boggs, 2005). Today, more so than ever, two-year colleges serve a critical role in maintaining the nation's economic competitiveness by increasing the earning power of individuals and providing the high-skilled workforce required by today's economy. Collectively, public two-year colleges enroll 46 percent of the total undergraduate degree-seeking population (American Association of Community Colleges, 2008) and 50 percent of all students receiving a bachelor's degree began their educational pursuits at a two-year college (National Commission on Community Colleges, 2008).

Statement of the Problem

In Montana, the percent of the state's total population participating in higher education ranks below the regional average and further still below the national average (Montana Office of the Commissioner of Higher Education, 2008). The U.S. Census Bureau (2005) projects shifts in Montana demographics through 2020 resulting in fewer

individuals meeting traditional aged student characteristics and increases in individuals representing non-traditional aged students. Yet in 2007 Montana enrolled only 2.1 percent of the total population 25 to 49 years of age, placing it last in the region and last in the nation for working adults who are enrolled part-time in college-level education or training (National Center for Public Policy and Higher Education, 2008b). While nationally two-year colleges enroll nearly half of the undergraduate enrollments in higher education (American Association of Community Colleges, 2008), in Montana only 21 percent of the total enrollments in higher education are in two-year colleges (Montana Office of the Commissioner of Higher Education, 2008).

Adult participation in higher education, including community colleges, varies across the United States (Shaffer, 2008). During the 1996-97 academic year, 43 percent of all undergraduate students were adults ages 25 and older (Mancuso, 2001). Nationally, public two-year colleges, most commonly community colleges, enroll the majority of these adults (Kasworm, 2003). However, Montana, when compared with other states, has witnessed considerably lower rates of adult enrollment in higher education, and only about one-half of the average enrollments in public two-year colleges (Montana Office of the Commissioner of Higher Education, 2008). Montana also struggles to keep adults enrolled through graduation. As of 2008, Montana had an estimated 164,014 adults age 25 and older who have some college but no degree (US Census Bureau, 2009).

It is estimated that Montana's share of the American Graduate Initiative is equivalent to 25,000 additional degrees and certificates by 2020 (Montana Office of the Commissioner of Higher Education, 2009). Although the numbers have been increasing, proportionately Montana's two-year colleges produce only 19 percent of all graduates in

Montana (National Center of Education Statistics, 2009). It will be necessary for Montana's two-year colleges to significantly increase their portion of degrees to meet the President's American Graduate Initiative challenge. In Montana this will require enrolling more adult students in the state's two-year colleges.

Much research has been focused on the question of why adults do not participate in education (Anderson & Darkenwald, 1979; Chao, DeRocco, & Flynn, 2007; Cross, 1981; Darkenwald & Valentine, 1985; Harrison, 1993; Scanlan & Darkenwald, 1984; Scanlan, 1986). Harrison (1993) referred to this as the *deterrent concept* suggesting "there are a number of barriers which stand between the potential learner and his or her participation in a learning opportunity" (p. 11). The literature also reveals significant research focused on the reasons why adults do participate in education (Anderson & Darkenwald, 1979; Aslanian & Brickell, 1980; Bishop & Van Dyk, 1977; Blair, McPake, & Munn, 1995; Carp, Peterson, & Roelfs, 1974; Cross, 1981; Darkenwald & Merriam, 1982; Steltenpohl & Shipton, 1986). However, most research focusing on deterrents and incitements to adult participation centers on the individual psychology, that is, it attempts "to explain participation without reference to the external factors that can also affect the decision" to enroll (Blair, McPake, & Munn, 1995, p. 636). Existing research has failed to focus specifically on or dissect the impact institutional and/or external situational barriers have on influencing adult participation in higher education, less still in two-year education. Schlossberg, Lynch and Chickering (1991) suggested these institutional barriers "arise from typical administrative, organizational and educational practices" (p. 28). Thus there remains a "need to understand other relevantly conceived variables and

their relationship to adults' participation in educational activities" (Scanlan, 1986, p. 20), specifically those under the influence or control of the educational system itself.

A high-skilled, highly-trained workforce will be necessary for the future economic success of the country. Increasing the number of individuals who participate in and complete two-year college degrees and certificates is essential to building this workforce. Many high-demand, high-wage occupations in the future will require some level of post-secondary education or credential (US Department of Labor, 2008). Individuals will be increasingly required to possess some form of post-secondary education to access life-sustaining employment. Thus, the problem this study addresses is three-fold. First, existing research has failed to focus on understanding the actual barriers to adult participation in public two-year colleges, providing little guidance to practitioners and policy-makers alike. Secondly, without this guidance, states such as Montana will continue to struggle with engaging more adults in higher education, furthering America's slippage in education levels and global competitiveness while missing the mark of the President's goal. Last, if states cannot implement strategic practices to improve over-all educational attainment, the country and its individuals will lack the necessary capabilities to rebuild a strong economy and create life-sustaining occupations for American citizens.

Purpose of the Study

The purpose of this study was to determine the extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. For the purpose of this study, state sociopolitical factors are generally defined as state social orientations (e.g., government funding, tuition levels, education policies, resolutions, or programmatic

offerings) related to the operational context of public two-year colleges that are the basis of governmental/quasi-governmental actions or socioeconomic constructs. Most commonly, these actions and constructs are the result of actions by legislative bodies, governing boards of higher education, and educational institutions themselves. By examining the effect of the state's sociopolitical factors on adult participation in public two-year colleges, this research explored the relationship between factors external to individuals and the phenomenon of adult enrollment in public two-year colleges, rather than the more commonly studied internal factors' influence on adult participation.

Why Adults

Higher education has historically been the domain of traditional-aged students. Since the founding of America, institutions of higher education have structured their environments and curricula to accommodate the youth emerging from secondary education (Rudolph, 1990). Beginning in the mid 1900's, certain phenomena have challenged that tradition. The Servicemen's Readjustment Act of 1944, more commonly known as the GI Bill, presented an opportunity for returning veterans to pursue a college education, and as many argue, resulted in the powerfully-educated Baby Boom generation that made America a world leader (Bishop & Van Dyk, 1977). The new GI Bill, reauthorized in 2008, has the potential of further encouraging the rate of adult participation in higher education. In addition, advances in technology and a shift to a knowledge economy, has necessitated life-long learning for many adults in the workforce (Drucker, 1999). Unfortunately though, adults have become the silent majority in an educational system that is purposely not designed for them (Sissel, Hansman, & Kasworm, 2001).

According to the National Center of Education Statistics (NCES) enrollment in higher education increased by 14 percent between 1987 and 1997, and in the following decade it increased at a faster rate (US Department of Education, 2009). While the majority of this growth was in the full-time, predominantly traditional-aged student demographics, much of the enrollment change was simply a result of increases in population for that group. Thus, while the total numbers of students increased, the actual participation rate stayed relatively stable. Although the number of traditional-aged students had grown more rapidly than the number of adult students, this trend is expected to change. Through 2017, NCES projects a rise of ten percent in enrollments of students under age 25, and an increase of 19 percent in enrollments of students age 25 and over.

Even with the trend of increasing adult participation, America continues to slip behind other nations in the proportion of young adults with a college degree (National Center for Public Policy and Higher Education, 2008a). In Montana, the population of adults with some college but no degree has crept to nearly ten percent of the population (US Census Bureau, 2009). Yet young adults are one of the only Montana population groups, active in the workforce, which is projected to grown in numbers through the next decade. According to the 2008 US Census Bureau's American Community Survey, of all Montanan's age 25 to 64, one-third (29.1 percent) are high school graduates only, while one-quarter (26.3 percent) have some college but no degree (Lumina Foundation for Education, 2010). Over one-half (55.4 percent) of all young adults in Montana who have completed high school do not have a college credential. Coupled with the shrinking population of high school students, and the already low participation rates of adults in Montana, further complicated by the meager enrollments in Montana's two-year colleges,

it is absolutely necessary for the state to focus on understanding how to engage more adults in postsecondary education, especially its public two-year institutions.

Why Public Two-Year Colleges

Engaging more adults in higher education, regardless of the institution type, is a laudable goal. Historically, it has been true that public four-year colleges and universities have served more students, and tend to perform better in key success measures such as graduation and retention, than two-year institutions (Velez, 1985; The Chronicle of Higher Education, 2009). The NCES reports that in 2006, over 56 percent of all college enrollments were in four-year institutions (public and private), while public two-year institutions comprised only 35 percent (US Department of Education, 2009). In more recent years, the emergence of private, for-profit institutions of higher education have commanded a rapidly increasing number of the total college enrollments. In fact, proprietary, or career colleges, have grown in enrollment at twice the pace of public institutions of higher education (Wilson, 2010). In many ways, these institutions have accomplished this feat by breaking the mold of traditional college delivery.

Much can be learned from public four-year colleges, and the fast-growing private, for-profit institutions, in regards to their significant potential for meeting the educational needs of the nation's future. However, there remain three primary reasons why, perhaps, public two-year colleges deserve specialized attention. First are the cost and affordability considerations. Public two-year colleges remain the most affordable option to the student and to the states. Nationally, tuition and fees at public two-year colleges are approximately 40% of that at public four-year institutions (National Center of Education Statistics, 2009). Public two-year colleges also cost taxpayers less. On average, public

two-year campuses spend nearly \$2,000 less per student FTE than public four-year institutions, over \$4,000 less than public research institutions, and over \$5,000 less than private bachelor's degree granting institutions (Delta Cost Project, 2009). And while the for-profit, proprietary colleges and universities are capturing a large share of the adult student population, much of which is at the two year level, there have been serious concerns raised about the financial burden students incur at these institutions. According to a recent report by the College Board, 53 percent of bachelor degree graduates at for-profit, four-year institutions leave school with more than \$30,500 worth of total debt (Baum & Steele, 2010).

There are also concerns for debt incurred by taxpayers for supporting the proprietary for-profit institutions. Much of the debt students incur, and the revenue used to generate profits for the institution's shareholders, are comprised of federal financial aid supported through public tax collections (Golden, 2010). In fact, private for-profit institutions of higher education are building their profit-generating business models with the majority of their cash flow derived from federal financial aid. For example, Grand Canyon University, bought by private investors in 2004, and now a for-profit institution operating under Grand Canyon Education Inc., derived over 80 percent of its revenue in 2009 from federal financial aid (Golden, 2010). ITT Technical Institute, a two-year, for-profit company that owns many career colleges, charged its students over \$25,000 in tuition and fees for the 2008-2009 academic year (US Department of Education, 2009). To pay this price tag, most students at ITT look to federal financial aid. In fact, Golden (2010) reported that "ITT derived 70 percent of its 2009 revenue from federal financial aid."

The second reason public two-year colleges deserve focused research attention is the shifting workforce expectations for college attainment. Stated previously, many of the high-demand, high-wage jobs of the future will be accessed through an associate's degree (Milano, Reed, & Weinstein Jr., 2009). It is also estimated that by 2018, 63 percent of all jobs in the United States will require some postsecondary education (Carnevale, Smith, & Strohl, 2010). Two-thirds of these will require at least some college or an associate's degree, while only one-third will require a bachelor's degree (Carnevale, Smith, & Strohl, 2010). Two-year colleges provide the gateway to the majority of these jobs, either directly through applied programming in occupational fields, or transfer curricula leading to a four-year degree (Boggs, 2005). While the private, for-profit, institutions have also recognized this by adding many two-year programs and enrolling a significant number of adults, their success rates have been questionable. For example, according to NCES, ITT Technical Institute graduated only 29 percent of its students in two-year programs in 2007 (US Department of Education, 2009). Many critics claim this is a result of private, for-profit institutions' focus on generating profit and not preparing students to be successful in their careers (Golden, 2010). In fact, this concern has stimulated proposed federal legislation requiring institutions to show proof that students are becoming gainfully employed when they complete their education (Epstein, 2010). Public two-year colleges typically focus their programming on the needs of their communities and occupational opportunities within them. While graduation rates certainly can be improved, two-year colleges are known for their ability to place their graduates in the fields with greatest employment demand and livable wages (Lum, 2007).

The last reason for focusing this research on public two-year colleges is the general assumptions about their design. Many aspects of public two-year colleges may be conducive and appealing to adult students. Their relative low-cost as compared to other types of colleges and institutions, the general open-admissions practices, flexibility in the delivery of their programming, and general focus on local needs, are all touted as characteristics fitting of adult students' needs and desires (Boggs, 2005; Ives, 2006; National Commission on Community Colleges, 2008). Unfortunately, many of these assumptions are untested in the literature, and across the United States enough disparity amongst these assumptions exists to justify focused exploration into these areas. This study contributed to that exploration.

Research Question and Hypotheses

Research questions and hypotheses “shape and specifically focus the purpose of the study” (Creswell, 2003, p. 108). In quantitative studies, research questions are broad investigative statements the researcher seeks to answer. Hypotheses are more specific and formal statements the researcher uses to postulate relationships between variables being studied (Cozby, 2007). Following the suggestions of Cozby (2007) and Creswell (2003), this study explored three research questions and tested eight hypotheses.

This study was revealed the relationship between state sociopolitical factors and the participation of adults in public two-year colleges, and how these factors differ in Montana from other states. Three research questions framed this quantitative inquiry:

Research Question One

What is the relationship between selected state sociopolitical factors and adult participation in credit-bearing coursework at public two-year colleges?

Research Question Two

What combination of selected state sociopolitical factors are the most predictive of the adult participation in credit-bearing coursework at public two-year colleges?

Research Question Three

Do the selected state sociopolitical factors with the strongest relationship to adult participation differ between Montana and those states enrolling the most adult students in public two-year colleges?

In an effort to answer the study's first and second research questions, a series of directional hypotheses were tested to examine the relationship between selected state sociopolitical factors and adult participation in public two-year colleges. These hypotheses focused on the general concepts of accessibility, affordability, and flexibility in higher education. Given the results of that examination, and to answer the third research question, these factors were explored to ascertain how they pertain to Montana in comparison to the states that enroll the greatest number of adult students. Hypotheses are further explained in Chapter Three.

Definitions of Terms

The definition of terms within scientific research provides clarity to readers in understanding the specific meaning of words and phrases used by the researcher (Creswell, 2003). In quantitative studies, the definition of terms creates construct validity for variables measured. Cozby (2007) states construct validity is achieved when the operational definition of key terms is adequate enough to "reflect the true theoretical meaning of the variable" (p. 86). Therefore, the following terms are defined to ensure

accuracy in the reader's interpretation of the terms and alignment with the researcher's application.

Adult Learner. Individuals 25 to 64 years old enrolled in at least one credit-bearing course at a public two-year college as reported by National Center of Educational Statistics' (NCES) Integrated Postsecondary Education Data System (IPEDS) Fall Enrollment Survey.

Adult Participation. NCES' IPEDS Fall Enrollment Survey headcount of students age 25 to 64 years enrolled in undergraduate credit-bearing coursework in public two-year colleges.

Adult Population. The sum total of the adults age 25 to 64 years living in a particular state as reported by the US Census Bureau's American Community Survey.

Dispositional Barriers. Individual and personal intrinsic barriers to participation in higher education "related to attitudes and self-perceptions about oneself as a learner" (Cross, 1981, p. 98).

High Participation States. The top 16 percent of states exhibiting the highest participation rate of adult learners in public two-year colleges for the years examined in the study. The top 16 percent, or approximately eight states, represent those states within the second and third deviation above the mean, assuming a normal distribution.

Institutional Barriers. Practices and procedures established by educational providers or governing bodies that tend to exclude or discourage working adults from participating in higher education (Cross, 1981).

Institutional Density. The number of public two-year colleges in the state as reported by NCES per 100,000 people as reported by the US Census Bureau.

Non-Traditional Student. Adults, typically age 25 and older, which have returned to school either full or part-time, and must balance school with employment, family, financial commitments, or other life circumstances (Ely, 1997).

Participation Rate. The proportion of the state adult population 25 to 64 years of age enrolled in undergraduate credit-bearing coursework in the state's public two-year colleges.

Situational Barriers. Barriers to participation in higher education "arising from one's situation in life at a given time" such as lack of personal time to commit to education (Cross, 1981, p. 98).

Sociocultural Barriers. Barriers resulting from "the reflection of a social environment in which education is not perceived as important or useful" (Blair, McPake, & Munn, 1995, p. 636).

Sociopolitical Factors. State social orientations related to the operational context of public two-year colleges that are the basis of governmental or quasi-governmental transactions.

Traditional Student. Students historically conceptualized as the undergraduate student; recent high school graduate, continuously enrolled in college, and typically aged 18-23 years (Adelman, 2005).

Two-Year College. A public postsecondary institution offering degree/certificate programs of at least 2 but less than 4 years in duration, including occupational and vocational schools with programs of at least 1,800 hours and academic institutions with programs of less than 4 years (National Center for Educational Statistics, 2008).

Delimitations

Delimitations in scientific research are identified to narrow the scope of the study (Creswell, 2003). This study is primarily delimited by exploring the phenomenon of participation in public two-year colleges by adult students ages 25 to 64. This specific age-range was chosen to align with the most common age-brackets in the data sets utilized in this study (NCES IPEDS Fall Enrollment Survey and the US Census Bureau's American Community Survey). This study is also delimited by confining the analysis of sociopolitical factors to distinct variables. Thus, this study is further delimited by only exploring the following: (a) number of public two-year colleges per 100,000 people in each state; (b) number of public two-year colleges as a percent of all institutions of higher education in each state; (c) number of public two-year colleges with open admission policies as a percent of all institutions of higher education in each state; (d) number of public two-year colleges that offer distance education as a percentage of all institutions of higher education in each state; (e) number of public two-year colleges that offer the opportunity for earning credit from prior experience as a percentage of all institutions of higher education in each state; (f) the economic incentive of obtaining a two-year degree measured as the difference in average annual earnings between high school and associate degree graduates in each state; (g) cost for attendance in public two-year colleges measured as the average annual tuition and fees as a percent of the median household income in the state; and (h) amount of state need-based financial aid available per 100,000 people in each state. Last, this study is further delimited by considering data gathered for the dependent and independent variables in this study from the 2003, 2005, and 2007 calendar years.

Limitations

Cross (1981) identified three categories of barriers to adult participation in education; situational, dispositional, and institutional. Hayes and Darkenwald (1988) later coined a fourth type of barrier, what they called sociocultural barriers. Blair, McPake and Munn (1995) suggested adult participation is the result of two phenomena; adults' purposes or goals for attendance, and "the circumstances or conditions in which they find themselves in" (p. 641). This study focused on those conditions external to the individual and under the control of policy-makers, administrators or other groups and individuals. The study primarily explored institutional barriers, although it also considered some situational barriers external to an individual's locus of control (e.g., the relative cost burden required to participate in higher education). However, many types of adult goals and circumstances influencing participation are issues related to individual situational and dispositional barrier categories not examined in this study. As a national study, with the state being the unit of analysis, this study assumed the frequency and distribution of these barriers *may* be similarly distributed across all states. However, that assumption was neither examined in depth, nor proven within this study, and therefore is should be considered as a potential limitation to this research.

In addition, the macro-level approach of this study presents another limitation as variables at the micro-level were difficult to control. For example, this study examined the potential relationship that exists between one dependent variable and eight independent variables. The measurement of the independent variables, while producing useful data for testing the hypotheses in this study, may have limitations of their own. As an example, in aggregate, state-specific variables may not account for micro-level

variations or anomalies. In addition, the summary necessary to arrive at consistent measures across states requires generalizations that could potentially hide institutionally disparate measures. The potential limitations in the study resulting from the use of specific independent variables are addressed in more detail in Chapter Three.

Significance of the Study

Longitudinal studies have shown the increases in earning power over time for individuals who have achieved associate degrees or some form of postsecondary credential when compared to those who have not (Day & Newburger, 2002). Earnings increase with education. In addition, many high-demand, high-wage occupations in the future will require some level of post-secondary education or credential (US Department of Labor, 2008). It will become paramount for individuals, especially young adults, to possess some form of post-secondary education credential to access life-sustaining employment. Yet, America continues to slip behind other nations in the proportion of young adults with an Associate's degree or higher (National Center for Public Policy and Higher Education, 2008a). In Montana, the state's percent of young adults possessing a post-secondary education credential and overall participation of adults in higher education are below the national average and well below the highest performing states (National Center for Public Policy and Higher Education, 2008b). The combination of an increase in adult populations, those individuals Montana has struggled to engage in higher education, and a decrease in traditional age student populations, suggests needed policy and systems reform if the state will continue to be economically competitive and socially advanced. Perhaps more significant is this study's national implications, by

considering the entire country's effectiveness at engaging adult learners and identifying what factors influence adult participation.

While numerous studies have focused on understanding personal factors impacting participation of adults in higher education, relatively little research has centered on how the macro-level sociopolitical factors inhibit or promote adult student enrollment. In addition, most studies have focused on asking individuals to offer their own perception on barriers, leaving the actual impact on enrollment suspect (Scanlan, 1986). In the seminal studies on the topic of adult participation, the most commonly applied approach to identify deterrents to adult participation has been to simply ask adults to self-identify why they are not participating (Cross, 1981). Although research on the topic has been limited since the 1980's, those studies that have been conducted have adopted a similar approach (see for example Aslanian, 2000 and Perna, 2000). Researchers have thus articulated concerns over validity and measurement issues with asking adults to self-identify why they are not participating.

This study instead focused on the desired outcome; actual enrollment of adult students and attempted to rectify similarities or differences between studies resulting in individually stated perceptions and actual participation. Yet more should be learned about the effectiveness of public policies designed to stimulate college attendance of adults. Legislators, policy-makers, taxpayers, college faculty and administrators could benefit from a better understanding of the aspects or actions under their control that contribute directly to increased participation rates of adults in higher education. With this knowledge, Montana stakeholders would be better equipped to make informed decisions and implement targeted activities increasing the number of adult students who

successfully enroll in public institutions of two-year education. Exploring the phenomenon of adult participation in higher education in the manner of this study provides both empirical findings to support these individuals while also addressing the relative absence of focused literature in this domain. This study was begins to fill those gaps.

Summary

Chapter One provides an introduction to the study. It outlines the pressing and long-term need for Montana, and the United States to engage more adults in the pursuit of higher education. More specifically, Montana must engage significantly more adults in public two-year colleges to keep pace with other states, and contribute to the national agenda for increased college graduates. To that end, this quantitative study explored three research questions. The first two questions explored the relationship between selected state sociopolitical factors and adult participation in credit-bearing coursework at public two-year colleges. The third explored how selected state sociopolitical factors with the strongest relationship to adult participation differ between Montana and those states enrolling the most adult students in public two-year colleges. A series of directional hypotheses helped frame the inquiry and further delimited the research. Ultimately, this study contributes to the body of knowledge pertaining to the participation of adult students in public two-year colleges by exploring those factors externally controlled or implemented that influence adult participation in higher education.

Chapter Two reviews literature both directly and peripherally relevant to adult participation in public two-year colleges. Given the broad constructs of accessibility, affordability, and flexibility, the literature review examines significant scholarly works

that have identified barriers and incentive factors in adult participation, or general participation in higher education. More specifically, literature pertaining to this study's specific hypotheses was examined to gain a broader understanding of the research and results already in existence, and/or to justify the inclusion of variables studied within this research.

CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

There is an apparent deficit in the quantity and depth of literature pertaining to the analysis of major, macro-level factors existing in the states and their relationship to the participation of adults in public two-year colleges. The purpose of this study was to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. To fully explore the relationship state sociopolitical factors have on adult participation in public two-year colleges it is necessary to review literature both directly and peripherally relevant to adult participation in two-year education. Two primary areas of literature were considered. First, research and scholarly analysis in the literature of the most commonly cited, considered, or tested reasons adults do and do not participate in education was reviewed. Second, and from the initial filter of the literature, a review of literature pertaining to specific barriers pertaining to the concept of sociopolitical factors was covered to ascertain the justification for their inclusion in this study. In both areas special attention was given to reviewing literature pertaining specifically to adult participation and public two-year colleges. This literature review will apply Boote and Beile's (2005) five categories for the analysis of a literature review in doctoral dissertations. These categories include: (a) Coverage, (b) Synthesis, (c) Methodology, (d) Significance, and (e) Rhetoric.

Why Adults Participate in Higher Education

Over fifty years of scholarship has produced models, paradigms, and theories of adult participation that exist within the literature. This study does not attempt to examine, test, or apply any of these theoretical models of participation; however, it is helpful to briefly highlight their areas of commonality before considering research that would test their assumptions. Understanding a complex phenomenon of human behavior such as the decision to engage in learning activities can be guided through good theory (Scanlan, 1986). This theory in turn helps researchers to develop hypotheses to be tested and an identification of specific variables to be measured. Through a meta-analysis of theories, models, and paradigms of adult participation in education activities, Scanlan suggests the theoretical foundations “share two general assumptions: (1) participatory behavior is a function of the interaction of both individual and environmentally determined variables, and (2) such variables may interact so as to enhance or inhibit the likelihood of participation” (p. 12).

Scanlan (1986) distinguished between two different types of variables associated with the educational participation of adults. He categorized them as falling under demographic variables or non-demographic variables. Demographic variables “represent the vital characteristics of an individual group or population, such as age, sex, income, and educational attainment” (p. 15). Scanlan states non-demographic variables are comprised of individual’s “situational, dispositional, and/or psychological characteristics” (p. 15).

Situational variables are descriptive attributes associated with the life circumstances of individuals, especially those pertaining to their careers, societal roles, or social

roles, or social support systems. Dispositional variables are attributes associated with the expressed values, attitudes, beliefs, or opinions of people. Psychological variables represent measures of individual psychological traits or personality factors. (Scanlan, 1986, p. 15)

A significant body of research exists pertaining to the evaluation of both demographic and non-demographic variables of adults who and who don't participate in education activities (Scanlan, 1986). More pertinent to this study, however, are the conclusions drawn from these studies as to why certain characteristics are more common than others. For example, in one of the earliest analyses of variables pertaining to adult participation in continuing education, Booth (1961) examined US Census Bureau data and identified that adults not participating in continuing education tended to be older, lived in more rural areas, were working in unskilled occupations, and typically had lower levels of education.

Johnstone and Rivera (1965) conducted a more comprehensive analysis through a survey of nearly 24,000 adults in the United States. Although their definition of education was broader than that used by Booth (1961), and their research design was more complex, their general findings were similar. They found that the adults who were not participating in some form of education were older, less educated, and living in rural areas. Non-participants tended to be from lower social, economic, and occupational levels than adults participating in education. Johnstone and Rivera found the most significant variables in regard to whether or not adults were participating or not included educational attainment, occupation, and income (Scanlan, 1986).

Nearly a decade later, Carp, Peterson, and Roelfs (1974) conducted a study similar to previous studies by surveying educational activities, needs, and interests of adults across the nation. Again the definition of education differed from previous studies. Carp, Peterson, and Roelfs categorized respondents as either “learners” or “would-be learners,” but again the results were overall consistent to previous studies in that those adults participating and/or interested in education tended to be younger, more affluent, and had higher levels of educational attainment. The researchers found some minorities (e.g., African Americans), older ages, and more rural residents, especially in the South, to be underrepresented in the “learners” category.

Most early studies assessed descriptive statistics about general demographic variables. One exception to this was a study by Anderson and Darkenwald (1979) who utilized stagewise regression analysis to assess the predictability of 11 different independent variables (both demographic and non-demographic) on the outcome of adult participation. Their findings suggested the most influential individual variable in predicting adult participation was the level of education. The higher the educational attainment of the individual the more likely they were to participate in educational activities. Anderson and Darkenwald found that the single most influential demographic variable on adult participation was age. The older the individual the less likely they were to participate in education activities. The researchers found statistical significance in almost all other variables assessed; however, only occupational status and working in the human services sector were deemed to be of practical significance according to researchers’ analyses.

Within their regression model, Anderson and Darkenwald (1979) designed an analysis for distinguishing between college participation at four-year and public two-year colleges. Their findings were quite different under this filter. Educational attainment continued to be the single most influential variable; however, where higher educational attainment resulted in greater participation at four-year colleges, lower educational attainment was a strong predictor of adult attendance at a public two-year college. The researchers attributed this variance to the understanding that most adult education at four-year colleges focused on professional or graduate level continuing education, whereas adults at public two-year colleges were in pursuit of high school equivalent credentials (e.g., GED) or their first post-secondary credential.

One final finding worth noting in Anderson and Darkenwald's (1979) research is the impact location had on the adult participation in public two-year colleges. They found that living in the Western states significantly increased the likelihood of adult participation in college activities. The researchers attribute this to the relative prevalence of wide networks of community colleges across states such as California.

Numerous other studies of adult learners' characteristics, both within the United States and other developed countries, have led to similar results (McGivney, 1993). They have consistently found that adults participating in education activities, regardless of how education is defined, tend to have higher levels of income and occupational status, are younger, and have achieved higher levels of educational attainment (Scanlan, 1986). The characteristics of adults who do and do not participate, although interesting, do not answer the question why or why they do not participate. These early studies, however,

have provided some insight into how demographic and non-demographic variables may be related to the institutional and situational variables influencing adult participation.

The survey research conducted by Johnstone and Rivera (1965) assessed both participant characteristics while also exploring the various reasons for adult participation in continuing education. They found the most commonly stated reason adults participate was to prepare for a new job or advance in the job they currently held. Even among adults in general, job related factors remain one of the most commonly cited reasons given for participating in educational activities (Carp, Peterson, & Roelfs, 1974). Various studies focused on specific occupational areas or industries have also suggested strong relationships between job related factors and the likelihood of adult participation in learning activities (Scanlan, 1986).

Research coinciding or following the early studies of demographic and non-demographic characteristics of adults revealed that reasons other than job-related factors influence adult participation. For example, Schlossberg, Lynch and Chickering (1991) found most adult learners interviewed engaged in education for a variety of “career, family and personal reasons” (p. 18). According to Bishop and Van Dyk (1977):

Participation of adults in higher education has been attributed to a number of factors: increased numbers of conveniently located colleges offering courses tailored to meet the special needs of adults, the need to learn new skills as old ones become obsolescent due to technological progress, and the increasing desire of men and women to obtain training that will make possible professional advancement. (p. 40)

In his pioneering work *The Inquiring Mind*, Houle (1961) studied the motivations of adults for engaging in learning activities. This work resulted in one of the first

motivational typologies for adult learning. Houle identified three major motivational areas: (1) goal-oriented areas, where learners seek education to achieve some purpose to fulfill a personal need; (2) activity-oriented areas, where adult participation in the learning activity is sought for the sake of the activity itself or the social interactions that result from participation; and (3) learning-oriented areas, where knowledge is sought primarily for the individual benefit of knowing. Houle recognized that while each of these areas may provide the major motivation for adult participation, all three overlap and the weight of an individual's motivation may be distributed in various amounts across all three.

Other scholars built on Houle's (1961) original typology. For example, Burgess (1971) employed a factor analysis of adult's motivations for learning and ultimately expanded Houle's three factors to seven. Morstain and Smart (1977) later studied students enrolled in evening classes and identified six factors related to adult motivations to engage in learning activities. Table 1 illustrates the evolution of adult motivation factor identification across these early studies.

Table 1

Motivational Factors Related to Adult Participation in Higher Education

Houle (1961)	Burgess (1971)	Morstain and Smart (1977)
Goal Oriented	Desire to reach a personal goal	Professional advancement
	Desire to reach a social goal	Social relationships
	Desire to reach a religious goal	Social welfare
Activity Oriented	Desire to take part in activity	
	Desire to escape	Escape/stimulation
Learning Oriented	Desire to know	Cognitive interest
	Desire to comply with formal requirements	External expectations

One of the most influential scholars on adult participation in higher education is K. Patricia Cross. In her seminal work *Adults as Learners*, Cross (1981) combined her research and that of and other key scholars in the field of adult education into a collective work centered on approaches to engaging adult students and facilitating their learning. In an in-depth meta-analysis of research on why adults participate and why not, Cross offers a detailed explanation of the major motivators for adult participation.

Cross' (1981) findings on methods for research of motivations to adult participation fall into four categories of: “(1) depth interviews, (2) statistical analysis of motivational scales, (3) survey questionnaires, and (4) hypothesis testing” (Cross, 1981, p. 81). From research conducted using all four methodologies, Cross identified the primary reasons (motivations) for adult participation in learning activities. Her typology and these motivations are identified in order from most important to least in Table 2.

Table 2

Motivations for Adult Participation in Learning (Cross, 1981)

Reason for Learning	Importance (1 high – 10 low)
Knowledge Goals	1
Personal Goals	2
Community Goals	3
Religious Goals	4
Social Goals	5
Escape Goals	6
Obligation Fulfillment	7
Personal Fulfillment	8
Cultural Knowledge	9
Other Reasons	10

Most adults state practical or pragmatic reasons for engaging in higher education (Cross & Zusman, 1979). They are goal-oriented as identified in the top classifications of their reasons for learning. Motivational typologies, while helpful in understanding the general pragmatism of adults' intrinsic drivers for participation and the psychological characteristics of adults in relation to their reasons for engaging in education, only offer a partial explanation of the phenomenon (Blair, McPake, & Munn, 1995). According to Cross (1981), these motivational factors are personal offers of perception and ideal, and should be taken with a bit of skepticism when translating the impact of these motivations on actual enrollment in learning activities.

Other studies have considered the impact on adults' life-changing circumstances as a way of understanding the phenomenon of adult participation in learning activities. Blair, McPake, and Munn (1995) describe this body of research as the "life transitions" theory, or "that learners can describe some past, present, or future change in their lives as a reason for learning" (p. 635). In a national study, Aslanian and Brickell (1980) interviewed nearly 2,000 American adults age 25 or older to understand what prompts adults to participate in learning activities. Eighty-three percent of the respondents identified some past, current or future change in their lives as the reason for learning, and that their success in learning determined the outcome of a successful transition. From their findings, the authors derived that an adult's decision to return to school is primarily related to either 'triggers and transitions' derived from developmental issues and crises they faced during their life. Aslanian and Brickell define transitions as the movement from one life status to another that requires new knowledge, skills, or credentialing often requiring the engagement in midlife education. Triggers on the other hand are events that

influence the timing of an adult's decision to engage in educational activities. In many ways the authors' work was foundational to understanding of the concept of life-long learning.

In their findings, Aslanian and Brickell (1980) identified seven major types of transitions and triggers. The most commonly reported ones pertained to vocational status such as changes in career, promotion or advancement in an existing job or changes in the demands of an individual's current job. The triggers identified as being most common related to family issues such as divorce, marriage, birth of children, empty nest, or deaths in the family (primarily of parents).

Conducting a follow-up study, Aslanian (2001) surveyed 1,500 American adults age 25 or older. Using similar methodology to her 1980 study, Aslanian found consistent similarities in adult responses citing major life transitions (again career related ones being the most significant) for participation in learning activities. Likewise, trigger events described by the respondents shared similarity with the earlier study as influencing the timing of engagement. More specifically, changes in life circumstances of adults will continue to be the primary reason for participation; more and more adult students will continue to seek learning in specific areas on a short-term basis; the availability and scope of distance learning will increase adult participation; life-long learning will be necessary to stay competitive in a global market; adults will exert an increased demand for graduate education; and new providers will continue to change the higher education landscape (Williams, 2003).

While quantitative analysis of reasons for engaging in higher education led to convenient categorization of adult students for research purposes, Blair, McPake, and

Munn (1995) suggested that the phenomenon is much more complex. Taking a qualitative research approach to understanding why adults engage in learning activities, Blair, McPake, and Munn conducted in-depth interviews with 50 adults in Scotland. From their data, the authors attempted to bridge the gap between the motivational typologies and transitions theories, observing, “by regarding participation as an outcome of the interaction of two factors in individuals’ lives: their goals and circumstances” or what the researchers call “conditions” (p. 637). They further asserted, goals “are the purposes adults have for returning to education: the outcomes they anticipate and the achievements for which they hope” whereas conditions “are those circumstances which both affect and are a product of adults’ lives (such as age, school experience, family situation and employment status)” (p. 637).

Blair, McPake, and Munn (1995) argued adult participation in learning activities is not the result of a logical, linear, or easily defined process, but often explodes to the dynamic interaction between goals and conditions in an adult’s life. They categorize goals as being either proactive, driven by adults’ determination to change themselves or their status, or reactive, triggered by life events. Conditions are also categorized by the authors as being either supply-side such as the existence of an accessible learning center or campus, services to support adult student enrollment, flexible learning opportunities, or demand-side such as family circumstances. Blair, McPake, and Munn suggested education providers, policy-makers and others focus on supply-side factors to create conditions that result in increased participation.

Similarly, Schlossberg, Lynch, and Chickering (1991) suggested educators should look at adult participation through an ecological concept. Adult participation in

education, they posit, is a combination of the multitude interactions between an individual and an environment. The authors suggest the “essence of the ecological perspective is that the onus cannot be placed on either the individual or the environment; rather human behavior is a continuous interaction between the two” (p. 23).

Why Adults Don't Participate in Higher Education

To this juncture, the literature reviewed has helped illustrate the characteristics of adult learners, and suggested a strong theory for the reason adults participate in educational activities. However, it may be more suiting for this research to now examine the study of why adults do not participate in higher education, paying close attention to research focused on those supply-side conditions under the influence of states and policy-makers. According to Cross (1981):

It is just as important to know why adults do not participate as why they do. Indeed, since it is usually the people who “need” education most—the poorly educated—who fail to participate, understanding the barriers to participation has been a subject of special interest to researchers and policymakers. (p. 97)

While Cross recognized the relative lack of research on barriers to adult participation, she builds from a few key works to offer more generalized categories of barriers to participation. Again, it is important to note that according to Cross' study the majority of research on barriers has been conducted through questionnaires, focus groups, and other methods using the individual as the case for observation. Thus many of the findings may not be actual indicators of why adults do not participate, but rather individual perceptions of those things they themselves feel would be barriers. For example, survey research on perceived barriers to participation suggest cost of attendance is the first or second most

important factor in whether or not adults will enroll (Cross, 1981). Yet other research focusing on the outcome of participation suggests increased cost of attendance does not influence adult participation as much as flexibility (Morey, 2004). Leslie and Brinkman (1987) found that sociological variables tend to be more important in influencing participation in higher education than economic ones. One needs only to consider the significant participation rates in many for-profit online institutions, such as the University of Phoenix's Axia College, which have considerably higher costs of attendance than public two-year institutions (Ives, 2006).

In their landmark study, Johnstone and Rivera (1965) found the most commonly cited reasons adults gave for not participating in education related to cost, time, and lack of energy. Surprisingly, those adults who were not participating in education, but were favorably disposed to the idea of education, were consistently less likely to cite any of these as barriers to their lack of participation. The researchers organized participant-cited barriers identified into two broad categories. First were environmental or situational deterrents, which include those barriers relating to external to an individual or beyond their sphere of influence. The second were categorized as internal or dispositional deterrents, or those barriers relating to personal attitude or disposition towards participating in learning activities (Scanlan, 1986).

Carp, Peterson, and Roelfs' (1974) study coincided with the findings of Johnstone and Rivera (1965). They surveyed over 3,000 adults who the researchers classified as "would-be learners" and asked them to identify the primary reasons they perceived as keeping them from engaging in learning activities. Cost and time constraints were given as the most important and were the most widely reported deterrents to participation. All

other deterrent variables were cited by less than 20 percent of the respondents.

Interestingly though, cost was identified as more of a barrier to younger students (less than 35 years of age) suggesting the emphasis at that time on professional and post-graduate continuing education as being desired for individuals in higher occupational classes. Time barriers were increasingly reported as the age of the respondents went up.

Analyzing her own, and others research, Cross (1981) categorized the obstacles most commonly cited by adults as barriers to their participation in learning activities. She identified three categories, or classifications, of barriers: (a) situational barriers; (b) institutional barriers; and (c) dispositional barriers. Situational barriers are “those arising from one’s situation in life at a given time” (p. 98). These include life responsibilities such as work, lack of money to participate, or family issues such as the unavailability of daycare. Dispositional barriers are “those related to attitudes and self-perceptions about oneself as a learner” (p. 98). These are often intrinsic in nature such as the lack of motivation or confidence in an individual’s ability to learn. Finally, institutional barriers “consist of all those practices and procedures that exclude or discourage ... adults from participating in educational activities...” (p. 98). These are typically issues with systems configuration or institutional policies, procedures or rules such as access or availability of higher education opportunities, etc. Hayes and Darkenwald (1988) later coined a fourth type of barrier, what they called sociocultural barriers. Sociocultural barriers result from “the reflection of a social environment in which education is not perceived as important or useful” (Blair, McPake, & Munn, 1995, p. 636). The most common of these is social disapproval.

Cross (1981) further categorized institutional barriers into five areas. These included (a) scheduling problems, (b) problems with location or transportation, (c) lack of relevant courses (relevant to goals or individual interests), (d) procedural problems related to enrollment, and (e) lack of information regarding procedures or the program(s) of study. In her survey of adults who were generally positive toward continuing education, Cross found the most commonly reported deterrents included “inconvenient locations, scheduling problems and lack of interesting or relevant programs” (p. 31).

Scanlan and Darkenwald (1984) surveyed a sample of adult health professionals to examine what they perceived as barriers to engaging in continuing education. Using a tool called the Deterrents to Participation Scale (DPS), they analyzed participant responses to 40 different items pertaining to barriers as identified from the review of literature and interviews. Scanlan and Darkenwald identified six major deterrent factors impacting adult participation. These included: (a) disengagement; (b) lack of quality; (c) family constraints; (d) cost; (e) lack of benefit; and (f) work constraints. Employing statistical regression analysis, the researchers were able to illustrate that nearly 40 percent of the variance in the participation status of respondents could be accounted for by these six factors.

To improve the validity of the original DPS when applied to a broader population of adults, Darkenwald and Valentine (1985) modified the DPS instrument and created the Deterrents to Participation Scale-General (DPS-G) and administered it to a larger, more heterogeneous sample of adults. Again six deterrent factors emerged from the analysis, however only one, cost, correlated to the earlier findings of Scanlan and Darkenwald (1984) from the use of the original DPS. The six factors identified from the DPS-G

included: (a) cost; (b) lack of confidence; (c) lack of relevance; (d) time constraints; (e) low personal priority; and (f) personal problems.

Scanlan (1986) concluded “participation behavior varies according to both the personal characteristics and the life circumstances of the individual” (p. 35). In a meta-analysis of the early literature exploring the deterrent concept to adult participation in education, Scanlan suggested between six and nine factors were found to be continuously related to whether or not adults engage in learning activities. Scanlan stated:

These factors include groupings of discrete variables associated with the following categories:

- Individual, family, or home-related problems (e.g. child care, poor health, transportation difficulties);
- Cost concerns, including opportunity costs and lack of financial assistance;
- Questionable worth, relevance or quality of available educational opportunities;
- Negative perceptions regarding the value of education in general including those related to prior unfavorable experience;
- Lack of motivation or indifference toward learning (e.g., anomie, apathy);
- Lack of self-confidence in one’s learning abilities, including lack of social support/encouragement;
- A general proclivity toward non-affiliation (e.g., marginal involvement in social activities); and
- Incompatibilities of time and/or place, especially those associated with conflicting demands of work. (pp. 35-36)

Spanard (1990) later summarized the affective barriers to adult participation in educational activities that have been most commonly identified throughout the research.

These include:

Institutional barriers such as location (place), schedules (time), fee structures (cost), and campus friendliness; situational barriers such as job commitments, home responsibility, lack of money, lack of child care, and transportation issues; and psychosocial, or what Cross (1981) calls dispositional barriers such as attitudes beliefs and values, self-esteem, opinions of others, and past experiences as a student. (Spanard, 1990, pp. 340-341)

A 1987 study of the Organization for Economic Cooperation and Development (Centre for Educational Research and Innovation/Organisation for Economic Cooperation and Development, 1987) concentrated on comparing levels and conditions of adult participation in higher education in ten developed countries. Building on that research, Schuetze and Slowey (2000) conducted longitudinal case studies examining the changes in adult participation in higher education within those same ten countries from the time of the 1987 study and 1997. They specifically focused on sociopolitical developments occurring during that timeframe appearing to impact the level of non-traditional students participating in higher education.

Drawing from the country cases studies Schuetze and Slowey (2000) identified six dimensions, “which appear to be more or less conducive to the participation of non-traditional students...” (p. 16). These include: (a) governance and control – the degree of institutional autonomy and the decentralization of decision-making from central state bureaucracy (p. 16); (b) institutional differentiation – the extent to which various types of

institutions (e.g., universities vs. community colleges) focus their mission to encourage or discourage participation of certain groups of individuals; (c) flexible (open) admissions criteria – the existence of alternative admissions routes “on the grounds of specific characteristics of learners (for example, their age and/or their work experience) or on the basis of specific entrance examinations or requirements” (p. 17); (d) participation and mode of study – the availability of “modes of study that accommodate the particular needs of non-traditional learners” (p. 18) specifically the extent of distance learning or policies for assessment of prior learning; (e) financial and other support – the relative cost of attendance and availability of financial support to all or specifically targeted at non-traditional learners, and other support mechanisms such as support for place-bound students or childcare facilities; and (f) continuing education opportunities – the availability of short courses or non-credit programs which serve as gateway activities to engaging adult learners.

Schuetze and Slowey (2000) identified criteria for each dimension and suggested these factors are variables that positively or negatively impact non-traditional student participation in higher education. In their study, and the original study by the Organization for Economic Cooperation and Development (1987), findings suggested countries which meet the criterion of these factors’ were more likely to enroll higher numbers of non-traditional students.

Schuetze and Slowey (2000) provide a good starting point for categorizing major sociopolitical factors relating to adult participation in higher education. Their work in establishing common factors across developed countries provides a comprehensive, macro-level approach to common comparators not found in other studies. These six

dimensions, in concert with Cross' (1981) institutional barriers concept, provide the broad context for the development of hypotheses explored in this study. With refinement, these factors were used in assessing the differences between Montana and other states in terms of institutional and policy configuration and how those differences may be attributed to different participation rates. Some dimensions have more bearing on the research questions within this proposed study and thus are examined with greater intensity. Other dimensions were considered only in ways they intersect with the dimensions deemed more applicable to the purpose of this study and its design.

One of the major reasons adults do not engage in higher education is because of the education system itself (McGivney, 1993). Sissel, Hansman, and Kasworm (2001) offer evidence of the neglect most institutions of higher education indirectly impose on adult learners. In addition, the authors point out the lack of sociopolitical support for adult learners (e.g., financial aid and pricing policies), compounded by the traditions of higher education which operate in a context that is designed to exclude adults. The authors found this counterintuitive in that the majority of "college" students in the United States are indeed non-traditional in terms of both age and class (Sissel, Hansman, & Kasworm, 2001).

Of particular note, Sissel, Hansman, and Kasworm (2001) identified common issues impacting the participation of adult learners in higher education. These include access, information, curricula, support, and visibility. Compounding these is the obvious lack of research and knowledge centered on adult learners from a sociopolitical perspective (Sissel, Hansman, & Kasworm, 2001). Therefore the authors called for "the actual development of knowledge and information about adult learners in higher education"

needing to stem from “outside the bounds of the traditional higher education research establishment” (p. 23). Sissel, Hansman, and Kasworm suggested policy and advocacy outside of academe is the first place to begin a transformation of higher education to encourage greater adult participation. This could be interpreted as suggesting policy makers and social constructivists can be the catalysts to implementing this change.

Mancuso (2001) conducted a benchmarking study of adult-centered practices by examining institutions of higher education that exemplified in the realm of adult participation and success. By utilizing a diverse benchmarking study group, Mancuso and colleagues evaluated 63 institutions across North American and Europe that had been nominated as exemplar institutions in regards to serving adult students. Ultimately six institutions were identified as ‘best-practices’ institutions and were ultimately explored through a qualitative grounded theory research approach. Only one community college was included in the final six best-practice institutions.

Thirteen general findings emerged from Mancuso’s (2001) qualitative benchmarking study. Mancuso stated the findings represented “guideposts giving directions for new responses to institutions seeking to meet the needs of adult students” (p. 179). In summary, these themes included: (a) the existence of a strong adults-focused mission; (b) shared decision making (including students) leading to responsiveness to student/community needs; (c) adult-focused curriculum design; (d) use of prior learning assessment programs; (e) multiple instructional delivery methods; (f) andragogical concepts integrated into the teaching-learning process; (g) open admission process; (h) adult-friendly student services; (i) faculty as more than teachers; (j) use of educational

technologies; and (k) a focus on keeping cost of attendance low. Some of these themes are described in further detail in the latter sections of this chapter.

Research on the Factors Influencing Adult Participation

Given the broad but consistent findings of the literature reviewed, with a focus on Cross' (1981), Scanlan's (1986) and Schuetze and Slowey's (2000) contributions, and the concluding charge of Sissel, Hansman, and Kasworm (2001), the remaining portion of this chapter will be comprised of a brief review of the literature pertaining to research on the influence of specific factors on adult participation. The intent of this focus is not to conduct a comprehensive literature review on each of these areas, but rather identify important scholarship to ascertain the justification for the variables to be included as the selected state sociopolitical factors in this study. In general, these factors fall under the auspices of those external variables, established by governmental or quasi-governmental actions that impact access, affordability, and flexibility of higher education. More specifically, the primary factors to be vetted through this section of the literature review include research that has explored: (a) the influence of local public two-year colleges on adult participation; (b) the influence of open admissions policies on adult participation; (c) the influence distance learning opportunities have on adult participation; (d) the influence of programs awarding college credit for prior experience; (e) the influence of an economic incentive for earning a two-year degree; (g) the influence of public two-year college tuition and fees; and (h) the influence of need-based state funded financial aid. Table 3 illustrates how the factors are organized using Cross' (1981) classification, Spanard's (1990) Affective Barriers, Schuetze and Slowey's (2000) six dimensions and the three general sociopolitical factor areas of access, affordability, and flexibility.

Table 3

Organization of Factors for Literature Review

Area for Review	Sociopolitical Dimension (Schuetze & Slowey, 2000)	Affective Barriers (Spanard, 1990)	Barrier Class (Cross, 1981)	Factor Classification
Influence of Local Two-Year College	Institutional differentiation	Place (Location)	Institutional	Access
Influence of Open Admission Policy	Flexible (open) admissions criteria	Campus Friendliness	Institutional	Access
Influence of Distance Learning	Participation and mode of study	Schedules (Time)	Situational	Flexibility
Influence of Credit for Prior Experience	Participation and mode of study	Schedules (Time)	Institutional/ Situational	Flexibility
Influence of Economic Incentive	Financial and other support	Fee Structure (Cost)	Situational	Affordability
Influence of Two-Year Tuition and Fees	Financial and other support	Fee Structure (Cost)	Situational	Affordability
Influence of Available Need-Based Aid	Financial and other support	Fee Structure (Cost)	Institutional/ Situational	Affordability

Influence of Local Two-Year Colleges

Understanding access to higher education is a complex process. At its most base definition though, access to higher education may be determined by the relative proximity of learners to a physical institution of higher education. It is commonly expected that institutions, especially state-supported public colleges and universities, will primarily serve residents of their immediate geographic vicinity and the state. This is even more pronounced in public two-year colleges. The very concept of “community

college” was formed on the basic assumption that these institutions would be supported by their communities to serve their communities (Thornton, 1966). Naturally then, public two-year colleges enroll students mainly from their immediate community, often the county which the college resides in (Provasnik & Planty, 2008).

Research has illustrated the impact local public two-year colleges can have on adult enrollment. Anderson and Darkenwald (1979) discovered adults living in the western states were significantly more likely to participate in college. They attributed this phenomenon to the “vast network of community colleges” that exists throughout the western states (p. 366). Whereas other studies have found rural residents are less likely to participate in higher education, those adults in the West, even in more rural settings, had higher attendance rates attributed to the accessibility of community colleges.

Bishop and Van Dyk (1977) studied institutional and individual determinants of adult participation in higher education. They found that the creation of a two-year college in an area where none had existed before doubled the attendance rate of adult students, even when another type of institution already existed in the area. Further, in their study they identified that the “only characteristics of local colleges that consistently had statistically significant effects on adult attendance were the existence of at least one two-year college within community distance” (Bishop & Van Dyk, 1977, p. 46).

Influence of Open Admissions Policy

The rate of participation of adult learners in higher education has been attributed to various factors. Some research has found adults have little time or tolerance for red tape in accessing higher education (Schuetze & Slowey, 2000). Others have identified the pressing need adults feel for expediency in entrance to exit of their college activities

(Steltenpohl & Shipton, 1986). Institutions of higher education with few or no selectivity criteria for admission tend to engage more adult learners (Bishop & Van Dyk, 1977).

Open admissions is a foundational element of the public two-year or community college educational philosophy and therefore it is not surprising that adults enroll more in these than any other type of institution (Boggs, 2005).

Adult students enter or reenter higher education with a different set of academic records. They often have outdated scores or no record of taking standardized tests of college readiness (e.g., SAT or ACT). In addition, high school transcripts may be dated and adult students may be “rusty” in terms of academic skills or content recollection. Institution’s which have open admissions practices, those not requiring certain scores on placement exams for enrollment, or those having alternative entry routes for adults tend to engage more adult learners (Schuetze & Slowey, 2000).

Schlossberg, Lynch, and Chickering (1991) pointed out that the admissions processes in traditional higher education are designed around the traditional student – a recent high school graduate, with little practical life experience, recent college entrance scores, and all this paperwork in their hands. The reality, according to the authors, is that adults wanting to enroll have neither the relevant documents, nor the tolerance for bureaucracy it takes to acquire them. Furthermore, the campuses therefore should place admission decisions “on judgments concerning the capacity of the institution to respond to the applicant’s educational needs and purposes and on the applicant’s current knowledge, competence and motivation” rather than on old documents, placement scores, or age-biased competency assessments (Schlossberg, Lynch, & Chickering, 1991, p. 71).

These open admissions concepts are inherent in the community college admissions philosophy (Boggs, 2005).

Mancuso (2001) found the impact of an open admissions process to be inherent in the makeup of institutions identified as best practice sites in her benchmarking study. She identified campuses which are adult-centered use “an inclusive, non-competitive admissions process designed to determine the best educational match for the adult learner” (Mancuso, 2001, p. 174). Her research found these institutions used an applicant’s knowledge, skills, and interests as factors in the admissions process, rather than relying on placement scores or traditional admissions criteria.

Influence of Distance Learning

Seminal research has illustrated that adult learners are employed, have heightened domestic responsibilities, do not have convenient physical access to higher education, or have other situational barriers to attending (Cross, 1981). In recent years, there has been significant enrollment growth of adults in online courses, and some argue this mode of instructional delivery often overcomes many situational barriers to participation (Allen & Seaman, 2007). Yet little research of any substance has been conducted on the availability of distance learning and its influence on the participation of adults in higher education. Research specifically focused on distance learning and adult participation in public two-year colleges is nearly nonexistent.

What does exist in the literature is a general consensus that adult students consistently seek higher education opportunities that fit their needs for flexibility and learning style (Cross, 1981; Cross & Zusman, 1979; Schuetze & Slowey, 2000). Those individuals supporting the concept of Andragogy believe in the assumptions that adults

tend to be self-directed in their learning, want to have input or control over what they learn and when they learn it (Knowles, Holton, & Swanson, 2005). Adult students are naturally drawn to the more prominent, self-directed role they must play in the online learning process (Royer, 2007). Distance learning provides a venue that offers both flexibility and the opportunity to structure learning at the pace and time the student controls. Thus the growing populations of online students tend to be older (Howell, Williams, & Lindsay, 2003). For example, a report published by the Montana Office of the Commissioner of Higher Education (2009) identified that of the 7,200 students enrolled in at least one online course offered through the Montana University System, 51 percent were non-traditional (defined as age 25 or older) in spite of the fact that non-traditional students represent only 33 percent of the total enrollments in the Montana University System. Of the 1,000 students enrolled in completely online programs, 79 percent were adults.

In his dissertation, Rezabek (1999) studied the motivations, barriers, and enablers of participation of adults in distance education at single community college in Iowa. His research, while lacking generalizability to a national audience because of a small sample within a limited geography, found adults cited distance education opportunities as one of the most influential enablers to participation in higher education. Participants in Rezabek's study identified distance education as a key element in helping students balance work, family and other life obligations while they pursued college coursework.

The potential for adult students to engage in higher education because of distance learning also holds promise for increasing participation. A 2005 national study by Eduventures, an education market research and consulting company, surveyed

prospective students in an attempt to assess their attitudes towards online education. The survey results found over 80 percent of the individuals over the age of 25 who responded said they would consider an online program (Chao, DeRoccco, & Flynn, 2007).

Influence of Experiential Learning Opportunities

Adult learners often come to higher education with a wealth of life and work experience (Knowles, Holton, & Swanson, 2005). In fact, scholars such as Knowles (1983) and Dewey (1958) would argue all learning is experiential. For decades colleges and universities have recognized that life experiences outside of academe are as beneficial to the education process as those occurring within the classroom walls (Meinert & Penney, 1975). Research has also illustrated that adults come or return to higher education with a sense of urgency in filling a need, wanting to reach their educational goal as quickly as possible (Steltenpohl & Shipton, 1986). Institutions that recognize the value of experiential learning outside of the college walls, award credit for this experience and ultimately helping accelerate adult learning, have the potential to enroll more adult learners.

In his book, *Experience and Learning: An Introduction to Experiential Learning*, Chickering (1977) explored the implications of experiential learning for higher education. He asserted programs that award credit for experiential learning open campuses from study solely in the classroom to myriad settings such as community organizations, museums, diverse agencies, and the workplace through students' current or previous experience. Chickering posited institutions who embrace learning through experience will benefit from strong adult participation when they "grant credit for the significant experiences adults bring to education and when they learn to establish connections

between education and experiences that already are part of the love and work of adult existence” (p. 73).

Experiential learning programs utilize a variety of tools to assess the alignment of life experiences gained outside of academe with those expected inside and award academic credit accordingly (Chickering, 1977). Having these programs in place not only provides an opportunity for adults to accelerate their way to their educational goal, but it suggests to them that institutions take seriously the significant knowledge, skills, and abilities acquired through business responsibilities, military training, and volunteer work. When states and institutions embrace this concept and provide these programs, adult accomplishments are validated and “adult learner motivation increases” (Schlossberg, Lynch, & Chickering, 1991, p. 85).

In her benchmarking study of best practices for engaging adult learners in higher education, Mancuso (2001) identified that the use of prior learning assessment programs was a fundamental characteristic of successful adult engagement. Through the use of standardized challenge exams, institutionally developed exams, portfolios, and other tools to assess prior learning, these institutions embraced the value of adults’ experiences external to the institution and embed these experiences in the academic plan for the individual.

Chao, DeRocco, and Flynn (2007) suggested that institutions with flexible entry points into the educational environment are more likely to capture an adult student market. According to the authors, campuses who grant credit for experience outside of a formal educational setting not only meets adult students where they are developmentally, but also entices adults in the opportunity to accelerate their progress towards goal

attainment. Although their assertions are not supported by empirical evidence, Chao, DeRocco, and Flynn draw on case studies of community colleges that employ experiential learning assessment programs and as a result have captured significant numbers of adult students.

Influence of Economic Impact

According to Agbo (2000), “one cannot underestimate the effects of anticipated starting salaries in determining students’ choices” in enrolling in higher education or choosing a field of study (p. 159). For adult learners, financial considerations and desired career/occupational advancement have ranked top in their personal motivations for participation in higher education (Cross & Zusman, 1979; Aslanian & Brickell, 1980; Aslanian, 2001). Individuals analyze how it will impact their current financial status and they assess the return on their investment in what their earning potential will be post-goal attainment. There is a positive correlation between higher levels of education and higher earnings, and the income gap between high school and college graduates has continued to increase (Baum & Ma, 2007). Day and Newburger (2002) found similar results in that the earning potential of individuals with some education past high school is increasing.

National longitudinal survey data have been analyzed by various researchers to ascertain the impacts of educational achievement on economic return. For example, Kane and Rouse (1995) studied the National Longitudinal Survey of the High School Class of 1972, which sampled 22,652 seniors from the high-school class of 1972. As one of the foundational labor-market return studies in the literature using this research approach, the authors found that students participating at a two-year college earned 10 percent more than students without any college education, regardless if an associate

degree was granted. In addition, this research illustrated the economic return of a college credit was positive and nearly the same between two- and four-year colleges.

Analyzing the same data set, Grubb (1993) also found positive economic returns for associate degree holders compared to their peers in the cohort with only a high school diploma. However, Grubb's study did not find any significant difference between the earnings of high school graduates and individuals with some college but no degree. Both Kane and Rouse (1995) and the Grubb findings revealed earnings for women with associate degrees were substantially improved over their high school graduate peers. Similar findings resulted from the work of Leigh and Gill (1997).

In a more recent study of 1,992 associate degree holders, Agbo (2000) found associate degree graduates earned nearly twice as much as individuals with only a high school diploma. Likewise, Marcotte, Bailey, Borkoski, and Kienzl (2005), using the updated data from the 2000 follow-up of the National Education Longitudinal Survey, examined the impacts of recent changes in the workplace and economy on earnings of community college students. Employing regression analysis, the researchers found similar results to the previous studies. Their results showed earnings for individuals "who enroll in community colleges and those who earn associate degrees are substantially higher than the wages and salaries of their peers whose education extends no further than high school" (Marcotte et al., 2005, p. 169). Although findings also suggested a positive return for individuals who successfully complete some courses but do not earn an associate degree, the overall economic return for those students and even those earning a certificate was less consistent across the study's sample population.

Historically, the earning gap between high school graduates and associate degree graduates has not been as great compared to bachelor degree graduates. However, the emergence of more high-demand, high-skill, high-wage jobs requiring specialized programs accessed through the associate degree are changing that trend (Day & Newburger, 2002). For example, in 2008 Montana associate degree graduates earned an average salary of \$31,751 while bachelor degree graduates earned only \$29,099 (Montana Office of the Commissioner of Higher Education, 2009).

Influence of Tuition and Fees

Affordability is thought to be one of the most influential factors in college participation. Historically states with higher public tuition levels have lower participation rates, and increases to in-state tuition have a negative effect on participation with low-income and community college students the most affected (Kane, 1995). According to Heller (1999), “Within states and for most groups, enrollment tends to respond negatively to higher tuition prices” when all other factors are kept equal (p. 80). Not surprisingly the influence of the price of college on student enrollment is probably the most-studied sociopolitical factor with relative commonality in their findings (Leslie & Brinkman, 1987). Through a meta-analysis of research on college price and student demand, Leslie and Brinkman (1987) evaluated the 25 most influential works on the topic spanning from the mid-1960s to the late 1980s. The vast majority of the research focused on assessing the influence of tuition and fees on student participation. However, just four of the studies focused solely on two-year colleges, and only one of those specifically on adult learners.

Leslie and Brinkman (1987) found in general that “reducing tuitions will have a greater positive enrollment effect than increasing tuitions will have a negative effect” (p. 195). They also found the greatest level of sensitivity to price changes existed within the two-year sector of higher education and amongst socio-economically disadvantaged populations. Other studies have shown that adults are more sensitive to cost fluctuations and that reducing the cost of tuition and fees at public two-year colleges significantly increases adult enrollment (Bishop & Van Dyk, 1977).

Other comparative studies across developed nations have given mixed signals about the impact of cost on adult participation. In a comparative study exploring the reported deterrents to adult participation in the US and Great Britain, American adults continually reported cost of participation low as a deterrent whereas those adults from Great Britain rated it extremely high (Darkenwald & Valentine, 1985). Some scholars attribute this finding to the disparity in family earnings between the two nations at the time of the study, where US income was significantly higher than Great Britain (McGivney, 1993).

Studies of cost impacts on participation in higher education typically use the variable of college tuition and fees as a percent of median family income (National Center for Public Policy and Higher Education, 2008a). Leslie and Brinkman (1987) found most research produced consistent findings that sensitivity to tuition and fees is strongest within the lowest income groups, and Bishop and Van Dyk (1977) found this particularly true of adults and minority groups. Public two-year colleges tend to enroll the majority of these populations (Provasnik & Planty, 2008). Thus, those institutions have a larger population of current and potential learners who are more sensitive to tuition and fee levels (Heller, 1999).

There is little doubt, given the breadth of scholarship on the topic, that cost has some impact on adult participation in higher education. The bulk of research suggests this is most pronounced in adult populations in economically-challenged social strata. Simply put, the poor or working class families respond more negatively to education cost fluctuations. For example, national reports across many countries illustrated how rapid increases in fees and tuition significantly lowered adult participation rates (McGivney, 1993). However, when the broader characterization of adults is considered, while many adults do report cost as being a barrier to participation, researchers have found that adults often have little idea of what the actual cost of participation is. This has led some “researchers to suspect that cost, like lack of time, is a socially-acceptable or face-saving reason for not participating, camouflaging the more complex and possibly unrecognized reasons” (McGivney, 1993, p. 18).

Influence of Need-Based Aid

The level of need-based financial assistance available to cover the cost of participating in higher education, especially among low-income families and two-year college students, may play an important role in influencing adult participation. The most widely known and broadly researched program for need-based financial aid began as the Basic Educational Opportunity Grant program of 1974, which was later named the Pell Grant program. The federal Pell Grant program provides federal grants to students based on the criteria of need. Thus the program is intended to help those students of the least financial means access higher education.

Even with the nation’s significant investment in Pell grants, the literature has revealed the program’s less than significant impacts on college-going rates of needy

students. In a foundational study, Hansen (1983) used Current Population Survey (CPS) produced by the US Census Bureau to explore changes in enrollment prior to implementation of the Pell Grant program and after. Hansen designed his study to focus on changes in enrollment of dependent, traditional-aged students. His findings concluded that there were no significant changes in enrollment patterns low- and moderate- income students post Pell Grant implementation.

While a few studies have contradicted Hansen's (1983) findings (see for example McPherson & Schapiro, 1991), most have produced similar results. For example, Kane (1994, 1995), concerned that Hansen's results were influenced by the Vietnam War, refined his approach and looked instead specifically at the enrollment changes in female students pre- and post-Pell Grant program. The results also illustrated no significant impact on college-going rates of traditional-aged, dependent students. Later, Perna (2000) and Cameron and Heckman (2001) produced similar results to Hansen's finding the introduction of the Pell Grant program did not seem to effect college enrollment rates of low- and moderate-income individuals.

However, a study by Seftor and Turner (2002) produced different results when focusing on adult students only. Using microdata from the October Current Population Survey produced by the US Census Bureau, Seftor and Turner employed similar methodology as Hansen's (1983) to evaluate the impact the Pell Grant program had on the college enrollment and choice of older, non-traditional students. Their findings suggested that changes in federal financial aid, specifically the creation of the Pell Grant program, have a significant effect on the participation rates of adult students. They also found the choice of college type for adult students was likely to be a community college.

Moreover, Seftor and Turner concluded the “behavioral effects for the traditional college-aged students associated with changes in the availability of Pell funding are modest, but responsiveness among older students is marked” (p. 349).

Need-based state sponsored student aid programs emerged in the late 1960s and through the 1970s. Some attribute this primarily to the establishment of the State Student Incentive Grant (SSIG) program in 1965 as part of the Higher Education Act. The SSIG provided federal matching funds to states that implemented need-based aid grant programs. Prior to its implementation, only 19 states had need-based aid programs, whereas by 1979 every state had at least one program in place (Doyle, 2008). The impact of these programs has been proven to positively impact student enrollment similar to the effect of change in college costs and pricing (Mundel, 2008).

Other studies have illustrated that grant aid distributed based on need, over all other financial aid, has the greatest effect on college participation (Clinedinst, 2004; Long, 2008). Heller’s (1999) study on the impact of tuition and state financial aid on public college participation found that a “decrease in state grant spending lead to declines in enrollment with the largest effect occurring among community college students” (p. 82). He also concluded the three minority groups of Hispanics, Blacks, and Asian Americans responded more to changes in state grant spending than White students.

Conducting a comprehensive literature review, Long (2008) compared seminal and recently emerging works researching the impact of financial aid on college choice and success. From the literature she concluded that state subsidies to students, especially those focused on unmet need (the difference between cost of attendance and the ability of a student to pay), had the greatest impact on college attendance, attainment, and choice.

Yet, while the overall amount of state spending on need-based aid has increased, it has paled in comparison to the increases in the level of spending on merit-based aid or the growing focus on loans, tax credits, and other aid programs (NASSGAP, 2006).

Long (2008) concluded that there remains a need for policy-makers to continue improving the programs and availability of need-based aid, especially for low-income students. She stated:

Students have significant unmet financial need suggesting that student financial aid is critical to improving college access and success. Despite substantial increases in access to higher education during the last several decades, postsecondary attendance in the United States continues to be stratified by family income. (p. 35)

As states continue to modify grant and aid programs, with an increasing shift to merit-based aid, or blended programs (those using a mix of need and academic merit to award state grant subsidies), researchers still recommend aid be given to those of the lowest-income first (McDonough, Calderone, & Purdy, 2007).

Summary

It is evident from the body of literature on the subject that barriers to adult participation in education “is a multidimensional concept, subsuming several logical groupings of psychological, social, and environmental variables” (Scanlan, 1986, p. 35). The depth and breadth of the research, as well as the variance in the design complexity, suggest significant interest in understanding the role and impact policy and practice play in encouraging enrollment. Unfortunately, much of the foundational research pertaining to adult participation in higher education occurred in the 1970s and 1980s, as is evident throughout this literature review. Even more focused research exploring specific

deterrents and incitements for adult participation seem to have occurred predominantly in the 1980s, 1990s, waning in the early 2000s. While this study does not attempt to explore why this trend exists, the relative absence of continued and focused research regarding adult participation in higher education, specifically in public two-year colleges, is in part a problem this study attempted to address.

Regardless of chronology of research, it has been supported by the literature that adult students tend to “enroll in a college that is readily accessible, relevant to current life needs, cost-effective, flexible in course scheduling and supportive of adult lifestyle commitments” (Kasworm, 2003, p. 7). These basic assumptions, derived from previous scholarship, provide the foundational underpinnings that justify and necessitate this study. It is the evaluation of some of these aspects, those explored throughout this chapter that guided the design of this study.

CHAPTER THREE

METHODOLOGY

Introduction

The purpose of this study was to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. Through this inquiry, the study employed a quantitative approach to identify what relationships exist between state sociopolitical factors and the rate of non-traditional student participation in credit-bearing coursework at public two-year colleges.

This chapter examines the methodological components of the study. To start, the research design is discussed including the unit of analysis and the analytic approaches employed. General concepts of the survey method plan will be discussed. Both independent and dependent variables will be covered. Next, the research questions and subsequent hypotheses are examined more in-depth to address independent variable selection. This examination will include identification of independent variables, justification for their inclusion in the research, data measurement, and sources. The third section of this chapter will identify the study's population and sample. External validity of the study will also be discussed. Finally, the last two sections will outline data collection procedures and basic approaches to the anticipated analysis of the data.

Research Design

This study is a non-experimental quantitative, cross-sectional study that seeks to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling

the most adult students. The study is considered cross-sectional in that it explored data during the three calendar years of 2003, 2005, and 2007, whereby observations were considered from each year as constants rather than exploring changes from year to year. The study is also considered non-experimental, since it does not seek to identify a cause and effect relationship. There are various ways of conducting non-experimental research yet behavior observation or measurement are common to them all (Cozby, 2007). It was the intent of this study to measure the behavior of adult participation in public two-year colleges through a cross-sectional analysis of existing data. Thus the archival research approach was employed. Cozby (2007) states that archival research does not require actual collection of original data; rather, the researcher “analyzes existing data such as statistics that are part of public records...or information contained in computer databases” (p. 118).

Unit of Analysis

This study used each state in the United States as the unit of analysis. Individual states, although impacted by national legislation and policy, still function with significant independence and authority for setting policy and direction of public education within the state’s boundaries. While federal policy and law does play a role in directing and impacting state-run higher education, those national factors are relatively equal in their application across all states (American Association of State Colleges and Universities, 2009). At the state level though, differences in many of the macro-level sociopolitical factors surrounding public post-secondary education are apparent. This study explored those differences and thus it used the state as the unit of analysis.

Dependent Variable

The essential behavior this study analyzed was the phenomenon of adult participation in credit-bearing coursework at public two-year colleges. For the purpose of this study, participation will be defined as the percentage of the state's adult population age 25 to 64 enrolled in at least one credit-bearing course at a public two-year college. This study examined the relationship between state sociopolitical factors and this participation rate, assessing to discover if the variation in the former is directly influential in the variation in the latter. This study does not pretend to identify causality of independent variables on the dependent variable, but rather the predictability of a relationship, if any, between the two. Therefore, adult participation rate will be the dependent variable.

Independent Variables

Having explained the dependent variable for the study, the independent variables must be identified to clearly focus the relationships being explored. According to Creswell (2003), independent variables are those "that (probably) cause, influence, or affect outcomes" (p. 94). For the purpose of this non-experimental study, independent variables will be examined to identify the relationship between selected state sociopolitical factors and adult participation in public two-year colleges. Simply stated, this research attempted to discover the extent to which state sociopolitical factors predict the outcome of adult participation. The literature is replete with evidence suggesting numerous variables influence adult participation in higher education (Anderson & Darkenwald, 1979; Carp, Peterson, & Roelfs, 1974; Chao, DeRocco, & Flynn, 2007; Cross, 1981; Darkenwald & Valentine, 1985; Scanlan, 1986; Schlossberg, Lynch, &

Chickering, 1991; Schuetze & Slowey, 2000). Therefore, this study and the independent variables being considered cannot intimate causality, only predictability. The eight independent variables used in this study are: (a) state institutional density; (b) the percent of public two-year colleges in the state; (c) the percent of public two-year colleges in the state with an open admission policy; (d) the prevalence of distance learning in the state; (e) the opportunity for earning college credit from prior experience; (f) the economic incentive of earning a two-year degree; (g) public two-year college affordability; and (h) the availability of need-based state funded financial aid. These eight variables have been derived from the literature reviewed in Chapter Two and are being explored specifically to address the research questions posed in this study.

Confounding Variables

Discussed in the review of the literature, Cross (1981) identified three categories of barriers to adult participation in higher education. One of those, dispositional, refers to individual or intrinsic barriers. Another barrier is institutional, which refers to systems or external barriers. The third barrier is situational, which refers to both internal and external forces impacting an individual's situation in life. This study explored those barriers external to or externally imposed on adult students. However, the variables relating to the individuals themselves could potentially impact the dependent variable even with attempts to control them. National surveys of adult learners have identified consistency in the responses of adult learners when asked to identify and rate situational and dispositional barriers to their participation in higher education (Carp, Peterson, & Roelfs, 1974). Through in-depth analyses of numerous state and national studies, Cross and Zusman (1979) categorized commonly identified situational and dispositional

barriers, ranking their frequency of responses by adult survey participants. More recent research and reports suggest the personal attributes and perceptions of adult learners and non-learners remain consistent to earlier studies (Chao, DeRocco, & Flynn, 2007). Therefore, an assumption of this study is that these variables have equity in the frequency and distribution across all state populations of adults and are thus fairly constant.

Without efforts to keep these variables controlled, and possibly even with attempts made to control them, these factors may act as confounding variables in the study. Cozby (2007) stated “confounding occurs when the effects of the independent variable and the uncontrolled variable are intertwined so you cannot determine which of the variables is responsible for the observed effect” (p. 150). As stated in Chapter One, the inability to control confounding variables remains a limitation to the study. However, while these situational and dispositional barriers could be regarded as confounding, there is no reason to believe that they wouldn’t come into play in equivalent ways state by state. By focusing on factors that the state can control socio-politically, assuming that adults in all states will face situational and dispositional barriers in equivalent proportion, it can reasonably be concluded that the differences seen state to state are the result of these sociopolitical variables.

Research Questions and Hypotheses

The purpose of this study was to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. Three research questions framed this quantitative inquiry. They are:

Research Question One

What is the relationship between selected state sociopolitical factors and adult participation in credit-bearing coursework at public two-year colleges?

Research Question Two

What combination of selected state sociopolitical factors are the most predictive of the adult participation in credit-bearing coursework at public two-year colleges?

Research Question Three

Do the selected state sociopolitical factors with the strongest relationship to adult participation differ between Montana and those states enrolling the most adult students in public two-year colleges?

In this section, the selected state sociopolitical factors being examined are dissected to clarify their role in the research. Each factor is translated into an independent variable (IV) and assigned a hypothesis to be tested. Eight independent variables and eight directional hypotheses were used in this study. Additionally, each independent variable is further described through the identification of its: *a priori* assumption (null hypothesis); specific measurement; the rationale for inclusion in the study; data source; and potential limitations if applicable.

IV1. Independent Variable 1: State Institutional Density

- i. Hypothesis: States with a higher institutional density will have higher participation rates of adult learners in public two-year colleges.
- ii. Null Hypothesis: There is no relationship between the state institutional density and the participation rate of adult learners in public two-year colleges.

- iii. **Measurement:** The number of public two-year colleges per 100,000 people in the state (note, because of the small number of colleges in comparison to total population in the states, 100,000 people will be used as the divisor rather than a simple per capita calculation to allow for more manageable numbers in statistical analysis and reporting).
- iv. **Rationale:** In reference to higher education participation, access remains one of the most commonly cited and studied variables (Adelman, 2007; Schuetze & Slowey, 2000). In its simplest form, access may be considered by the proximity and availability of an institution of higher education to potential students. Additionally, Bishop and Van Dyk (1977) found that the existence of a local two-year college had doubled the college attendance rate of local adults. Considering the relative number of public two-year colleges in relation to the state's population is a worthy indicator of access to higher education and certainly within the sphere of influence of sociopolitical factions.
- v. **Data Source:** The number of institutions of higher education and enrollment of adults were collected through the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS). Population estimate data were collected from the United States Census Bureau's American Community Survey.
- vi. **Potential Limitation:** This measurement does not take into account the geographical distribution of the institutions or the state's population.

Community colleges often arise from areas of dense population; however in the more rural states it is not uncommon to find them in very small municipalities (Shaffer, 2008). It is anticipated that this phenomenon will balance variance in institution and population distribution.

IV2. Independent Variable 2: Percent of Public Two-Year Colleges

- i. Hypothesis: States with a greater percentage of public two-year colleges in relation to the total number of institutions of higher education will have a higher participation rate of adult learners.
- ii. Null Hypothesis: There is no relationship between the percent of public two-year colleges in relation to the total number of institutions of higher education and the participation rate of adult learners.
- iii. Measurement: The number of public two-year colleges as a percent of all institutions of higher education in the state.
- iv. Rationale: Proportionately, public two-year colleges enroll more adult students than any other type of institution of higher education (Provasnik & Planty, 2008). The presence of a local two-year college significantly increases the enrollment rate of adult students (Bishop & Van Dyk, 1977). It is therefore logical to test the hypothesis that states with more public two-year colleges will enroll a greater proportion of the state's adult students.
- v. Data Source: The number of public two-year colleges and total institutions of higher education in each state were collected through

the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS).

IV3. Independent Variable 3: Percent of Open Admissions Colleges

- i. Hypothesis: States with a higher percentage of public two-year colleges with open admissions will have higher participation rates of adult learners.
- ii. Null Hypothesis: There is no relationship between the proportion of two-year colleges with open admissions and the participation rates of adult learners.
- iii. Measurement: The number of public two-year colleges with open admissions policies as a percent of all institutions of higher education in each state.
- iv. Rationale: Adult students often have outdated scores or no record of taking standardized tests of college readiness (e.g., SAT or ACT). In addition, high school transcripts may be dated and adult students may be “rusty” in terms of academic skills or content recollection. Institutions which have open admissions practices, those not requiring certain scores on placement exams for enrollment or those having alternative entry routes for adults tend to engage more adult learners (Schuetze & Slowey, 2000).
- v. Data Source: The number of public two-year colleges with open admissions and total institutions of higher education in each state

were collected through the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System (IPEDS).

- vi. Potential Limitation: In many states it is not uncommon to find multiple four-year colleges with open admissions. Should this variable influence adult participation, considering only two-year colleges may under-value its influence on participation in states with a significant number of open admissions four-year colleges and universities.

IV4. Independent Variable 4: Prevalence of Distance Learning

- i. Hypothesis: States with a higher percentage of public two-year colleges who offer distance education will have higher participation rates of adult learners.
- ii. Null Hypothesis: There is no relationship between the percent of public two-year colleges offering distance learning in a state and the participation rate of adult learners.
- iii. Measurement: The number of public two-year colleges that offer distance education as a percent of all public two-year colleges in the state.
- iv. Rationale: Many adult learners are employed, have heightened domestic responsibilities, do not have convenient physical access to higher education, or have other situational barriers to attending (Cross, 1981). There has been significant enrollment growth of adults in online courses as the new mode of instructional delivery often

overcomes many situational barriers to participation (Allen & Seaman, 2007). The prevalence of distance learning is therefore included as a potential factor influencing adult participation.

- v. Data Sources: The number of public two-year colleges in each state that offer distance learning were collected through the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System's (IPEDS) annual Fall Enrollment Survey.
- vi. Potential Limitation: The IPEDS Fall Enrollment Survey asks institutions to simply report whether or not they offer courses via distance learning. Answers are either 'yes' or 'no'. However, a 'yes' response in one institution may not be equivalent to a 'yes' in the other, as the number and quality of courses may vary significantly. This variable does not control for those differences.

IV5. Independent Variable 5: Opportunity for Earning Credit for Prior Experience

- i. Hypothesis: States with a greater number of public two-year colleges allowing the assessment of prior work/life experience for college credit will have higher participation rates of adult learners.
- ii. Null Hypothesis: There is no relationship between the number of public two-year colleges in a state offering the opportunity for earning credit from prior experience and the participation rate of adult learners.

- iii. **Measurement:** The number of public two-year colleges that offer the opportunity for earning credit from prior experience as a percent of all public two-year colleges in the state.
- iv. **Rationale:** Adult learners often come to higher education with a wealth of life and work experience (Knowles, Holton, & Swanson, 2005). It is not uncommon for an adult's learning through experience to be deemed equivalent to the learning occurring in the classroom (Meinert & Penney, 1975). Institutions that recognize this, and award credit for this experience, have the potential to enroll more adult learners.
- v. **Data Sources:** The number of public two-year colleges in each state that offer opportunities to earn credit from prior experience were collected through the National Center for Educational Statistics (NCES) Integrated Postsecondary Education Data System's (IPEDS) annual Fall Enrollment Survey.
- vi. **Potential Limitation:** The IPEDS Fall Enrollment Survey asks institutions to simply report whether or not they award credit for students' prior experience. Answers are either 'yes' or 'no'. However, a 'yes' response in one institution may not be equivalent to a 'yes' in the other, as the program options may vary significantly. This variable does not control for those differences.

IV6. Independent Variable 6: Economic Incentive of Two-Year Degree

Attainment

- i. Hypothesis: The adult participation rate will increase as the difference in annual earnings between high school and associate degree graduates in the state increases.
- ii. Null Hypothesis: There is no relationship between the participation rate of adult learners and the difference in annual earnings between high school and associate degree graduates.
- iii. Measurement: The economic incentive of obtaining a two-year degree measured as the difference in average annual earnings between high school and associate degree graduates in the state.
- iv. Rationale: For adult learners, financial considerations have ranked top in their personal motivations for participation in higher education (Cross & Zusman, 1979). Adults analyze how college participation and credentials will impact their current financial status, and they assess the return on their investment in what their earning potential will be post-goal attainment (Cross, 1979). There is a positive correlation between higher levels of education and higher earnings, and the income gap between high school and college graduates has continued to increase (Baum & Ma, 2007).
- v. Data Sources: Average annual earnings for high school and associate degree graduates were collected from the United States Census Bureau's American Community Survey.

- vi. Potential Limitation: The Census Bureau first computed the earnings by educational attainment during the 2004 American Community Survey. 2003 data are not available. This study made the assumption data from 2004 was similar enough to 2003 to provide a valid indicator for the state observation on this variable. That assumption, however, could be considered a limitation to this study and variable.

IV7. Independent Variable 7: Public Two-Year College Affordability

- i. Hypothesis: The adult participation rate is lower in the states where the average costs of attendance at public two-year colleges as a percent of median household income is higher.
- ii. Null Hypothesis: There is no relationship between the participation rate of adult learners in the states where the average costs of attendance at public two-year colleges as a percent of median household income is higher.
- iii. Measurement: The cost for attendance in public two-year colleges measured as the average annual tuition and fees as a percent of the median household income in the state.
- iv. Rationale: Affordability is thought to be one of the most influential factors in college participation. Studies have shown that adults are more sensitive to cost fluctuations and that reducing the cost of tuition and fees at public two-year colleges significantly increases adult enrollment (Bishop & Van Dyk, 1977). While major studies use college cost as a percent of median family income (National

Center for Public Policy and Higher Education, 2008a), few have examined the actual impacts this ratio has on participation. This variable is considered a measurement of the average family's ability to pay for attendance at a public two-year college.

- v. Data Sources: Data for this variable were collected from two sources. Median household income by state was gathered from the US Census Bureau's American Community Survey. Average cost of attendance at public two-year colleges (tuition and fees) was gathered through the National Center for Educational Statistics (NCES) Digest of Education Statistics.

IV8. Independent Variable 8: Availability of Need-Based Aid

- i. Hypothesis: The adult participation rate will increase as the levels of state funded need-based financial aid increases.
- ii. Null Hypothesis: There is no relationship between the level of state funded need-based financial aid and the participation of adult learners.
- iii. Measurement: The total state funded need-based financial aid spent per 100,000 people in the state. (Note total population in the states varies considerably. This variance assumes different levels in tax contributions to state budgets. Thus, 100,000 people will be used as the divisor to control for disparity between states.)
- iv. Rationale: The level of need-based financial assistance available to cover the cost of participating in higher education may play an

important role in influencing adult participation. Studies have illustrated that grant aid distributed based on need has the greatest effect on college participation (Clinedinst, 2004). Yet state grant aid allocated on the basis of financial need has lagged behind the spending on merit-based aid (Baum, Payea, & Steele, 2009). These conflicting factors justified further examination in this study.

- v. Data Source: State need-based financial aid data and FTE enrollment were collected from the National Association of State Student Grant and Aid Programs (NASSGAP) annual Survey Report on State-Sponsored Student Financial Aid. Population estimate data were collected from the United States Census Bureau's American Community Survey.
- vi. Potential Limitation: NAASGAP, in its annual survey, distinguishes need-based aid spent in each state by using state-level definitions of need. Although many states use similar definitions of need, it is likely that some definitions may vary between states. Therefore, the possibility exists for variance in what is counted as need-based aid in different states, posing a potential limitation to this study.

Census

This study sought to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. Through a state-by-state analysis, this study compared these factors to the participation rates of adults in credit-

bearing coursework at public two-year colleges to provide a comprehensive comparator data set for the entire United States. Therefore, this research constitutes a census study. A census is the process of obtaining information about every member of a population, where each component of the population is considered in the sample (Cozby, 2007).

External validity is strong in a census approach. The findings of this study should be representative of the entire population and thus, within the delimitations of the study, can be generalized to the entire population.

Data Collection Procedures

This study employed an archival research design. According to Cozby (2007), archival research, also called secondary analysis, “involves the use of previously compiled information to answer research questions” (p. 118). Data were gathered through statistical record sources, primarily governmental or non-profit organizations that conduct annual, nationally vetted and accepted surveys. These include such sources as the National Center for Education Statistics’ (NCES) Integrated Postsecondary Education Data System (IPEDS) and the US Census Bureau’s databases. Data gathered from statistical records came from both published sources and through customized data queries by the researcher. All data were hand-gathered. Table 4 summarizes the variables and their data source under examination in this survey. Brief summaries of the data sources are provided in the following sections of this chapter.

Table 4

Research Variables and Data Source(s)

Variable	Variable Type	Statistic	Data Type	Data Source(s)
Adult Participation Rate	Dependent	The percent of the state adult population 25 to 64 years of age enrolled in undergraduate credit-bearing coursework in the state's public two-year colleges.	Ratio	US Census Bureau's American Community Survey; NCES' IPEDS Fall Enrollment Survey
Institutional Density	Independent	The number of public two-year colleges in the state per 100,000 people.	Ratio	US Census Bureau's American Community Survey; NCES Digest of Education Statistics
Percent of Two-Year Colleges	Independent	The number of public two-year colleges as a percent of all institutions of higher education in the state.	Ratio	NCES Digest of Education Statistics
Percent of Open Admissions Colleges	Independent	The number of public two-year colleges with open admissions as a percent of all public two-year colleges in the state.	Ratio	NCES Digest of Education Statistics
Prevalence of Distance Learning	Independent	The number of public two-year colleges that offer distance education as a percent of all public two-year colleges in the state.	Ratio	NCES IPEDS Fall Enrollment Survey
Opportunity for Earning Credit for Prior Experience	Independent	The number of public two-year colleges that offer the opportunity for earning credit from prior experience as a percent of all public two-year colleges in the state.	Ratio	NCES IPEDS Fall Enrollment Survey
Economic Incentive of Two-Year Degree	Independent	The economic incentive of obtaining a two-year degree measured as the difference in average annual earnings between high school and associate degree graduates in the state.	Ratio	US Census Bureau's American Community Survey
Two-Year College Affordability	Independent	The cost for attendance in public two-year colleges measured as the average annual tuition and fees as a percent of the state median household income.	Ratio	US Census Bureau's American Community Survey; NCES Digest of Education Statistics
Availability of Need-Based Aid	Independent	The total state funded need-based financial aid in the state per 100,000 people in each state.	Ratio	NASSGAP Survey on State-Sponsored Student Financial Aid; US Census Bureau's American Community Survey

American Community Survey

The American Community Survey (ACS) is a monthly survey that culminates in an annual report by the US Census Bureau. Its purpose and origins arose from growing interest of many groups for continuous measurement of population demographics rather than reliance on the decennial census (US Census Bureau, 2009). According to the Census Bureau, the history of the ACS can be considered in four stages; (a) the concept stage where design proposals were advanced, (b) the development stage in the late 1990s where the model was refined, (c) the demonstration stage in the early 2000s where the bureau conducted national pilot tests of the model, and (d) the implementation stage which began in 2005.

The ACS' methodology was influenced by Kish's (1981) early work on continuous measurement as an alternative to a decennial census. The model itself has been built from the original design proposals of Alexander's (1992) Continuous Measurement Series. Using a monthly sample of 250,000 individuals, the ACS collects data, very similar to that of the decennial census, on large populace areas in the US and Puerto Rico. This study used data from the ACS to provide annual state-level data on variables such as median household income and estimated population by age-groups. More information on the ACS' history, design, and methodology can be found on the US Census Bureau's website at <http://www.census.gov/acs/>.

NCES Digest of Education Statistics

The National Center for Education Statistics (NCES), housed within the US Department of Education's Institute of Education Sciences, is the primary federal entity for collecting and analyzing data related to education in the US. NCES conducts a broad

spectrum of education research and produces numerous reports and analyses based on its findings. One such product is an annual compendium called the Digest of Education Statistics. According to NCES (2009):

The Digest's primary purpose is to provide a compilation of statistical information covering the broad field of American education from prekindergarten through graduate school. The Digest contains data on a variety of topics, including the number of schools and colleges, teachers, enrollments, and graduates, in addition to educational attainment, finances, and federal funds for education, libraries, and international comparisons.

NCES' Digest of Education Statistics annual compendium has been produced for over 46 years with its origins dating back to 1962 (US Department of Education, 2009). Data within the compendium is derived from many sources, including both government and private sectors. The Digest specifically incorporates the results of surveys and other research carried out by NCES. For this study, the variable data provided by the digest were gathered through NCES' Data Analysis System (DAS), an online application that allows customized queries of the Digest's data tables. More information on the Digest is available at <http://nces.ed.gov/programs/digest/>.

IPEDS Fall Enrollment Survey

Another product of NCES' surveys and research is the Integrated Postsecondary Education Data System (IPEDS). IPEDS collects data from all postsecondary institutions that participate in the federal student financial aid programs. As required by the Higher Education Act of 1965, "all institutions that participate in federal student aid programs report data on enrollments, program completions, graduation rates, faculty and staff,

finances, institutional prices, and student financial aid” (US Department of Education, 2009).

IPEDS collects data on US postsecondary education in seven primary areas: (a) institutional characteristics; (b) institutional prices; (c) enrollment; (d) student financial aid; (e) degrees and certificates conferred; (f) student persistence and success; and (g) institutional human and fiscal resources (US Department of Education, 2009). This study utilized IPEDS data gathered as part of the IPEDS Fall Enrollment Survey. State-level observations were collected through customized queries built from the IPEDS’ Data Center (available at <http://nces.ed.gov/ipeds/datacenter/>). More information about IPEDS is available at <http://nces.ed.gov/ipeds/>.

NASSGAP Annual Survey

The National Association of State Student Grant and Aid Programs' (NASSGAP) is comprised of representative agencies in each US state or territory that is responsible for state-funded student aid programs. In Montana, this is the Montana Guaranteed Student Loan Program which is housed within the Office of the Commissioner of Higher Education. For nearly 40 years, NASSGAP has been conducting an annual survey of US states and territories to collect data regarding state-funded expenditures for postsecondary student financial aid. The results of the annual survey are presented in NASSGAP’s Annual Survey Report of state-administered student financial aid. The Annual Survey Report provides statistics on basic program information and expenditures, longitudinal indicators of student aid funding, and comparisons of student financial aid available in each of the 52 states and territories (Washington DC and Puerto Rico).

For this study, NASSGAP's online query tool (www.nassgap.org/customquery) was utilized to generate comparative observations on the amount of state funded need-based student financial aid that was available during each of the years under observation.

Data Analysis

A cross-sectional approach to data analysis guided this study. For the purpose of this research, archived statistical record data were gathered from surveys observing phenomena during the 2003, 2005, and 2007 calendar years in aggregate. Only data from this timeframe were used in the statistical analyses, with the one exception of the Census Bureau's 2004 American Community Survey earnings by educational attainment data, as 2003 data were not available. For this study though, those data were considered in the 2003 observations. While the data encompasses multiple years, they are still considered a cross-sectional sampling from the time-frame and therefore longitudinal statistics were not employed. Data from these years were utilized in this study for three primary reasons. First, the NCES only requires the reporting of demographic enrollment data (the foundational basis of the dependent variable in this study) during odd years of its IPEDS Fall Enrollment Survey. Second, to mitigate the limitations of cross-sectional data – primarily, the worry one point in time could potentially hold an anomaly from the more consistent reality – this study considered three years of data to minimize the potential influence of an abnormal year. Third, regression analyses, the statistical procedures employed in this study, require a threshold of observations greater than the 50 state observations that would be available for one year's worth of data for the United States. Tabachnick and Fidell (2001) suggest using $N \geq 50 + 8m$ (where m is the number of independent variables) for testing the multiple correlation and $N \geq 104 + m$ for testing

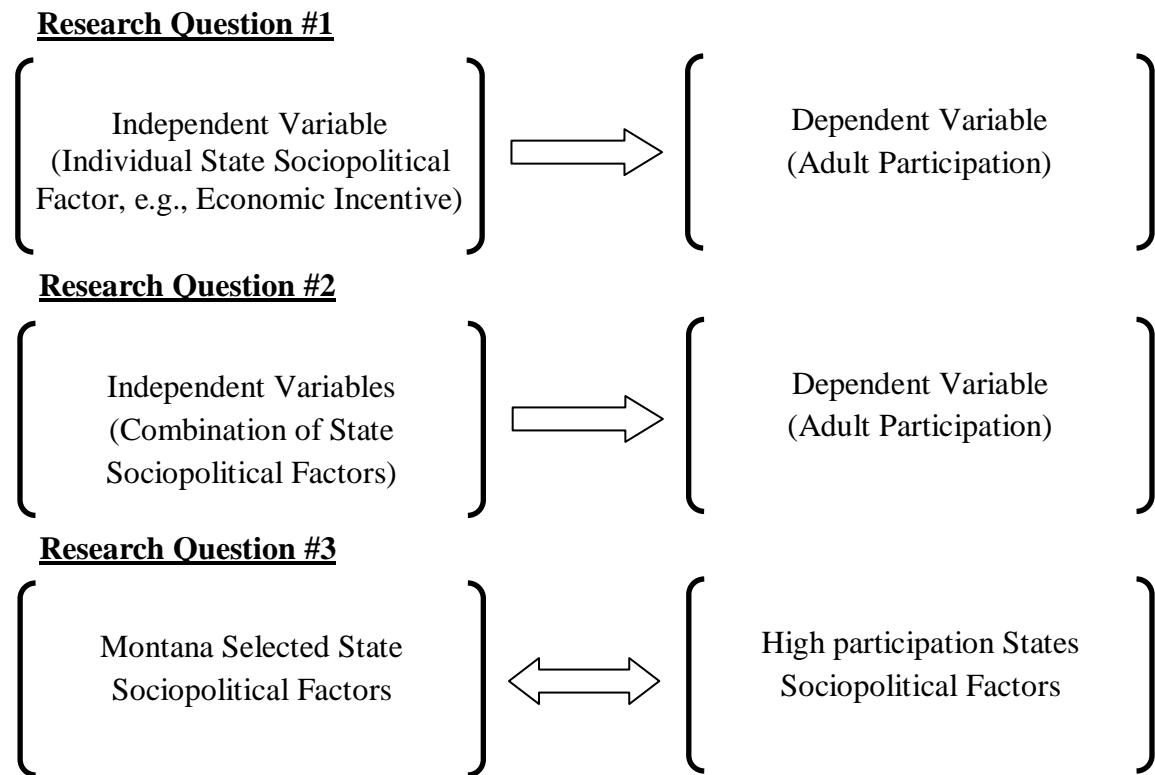
individual independent variables. They further recommend using the greater of two numbers if multiple forms of regression analysis are reemployed.

For this study, using a cross-sectional sampling of three consecutive years from the census (the United States) provided 150 observations, meeting the threshold for both single and multiple correlation testing. For example, using $N \geq 50 + 8m$ (where m equals the eight independent variables) the formula results in $50 + 8(8) = 114$ observations required. Using $N \geq 104 + m$ results in $104 + 8 = 112$. Thus, three years in aggregate offer a sufficient number of observations for the requirements of the statistical procedures used in the study.

The conceptual framework for this study was built on the notion of assessing the relationship between quantitative measures of selected state sociopolitical factors, both individually and in concert, and the dependent variable of adult participation in credit-bearing coursework at public two-year colleges. A final component of the framework is to conduct comparisons of those sociopolitical factors with the strongest relationships to adult participation between Montana and high participation states. High participation states will be defined as the top 16 percent of states exhibiting the highest participation rate of adult learners in public two-year colleges for the years examined in the study. Assuming a normal distribution because of the census approach, 16 percent contains those states that are two and three standard deviations above the mean.

Figure 1 visually illustrates the conceptual framework of this study. A single arrow identifies the hypothesized influence independent variables will have on the dependent variable. The double arrow represents a two-way comparison between Montana and high participation states.

Figure 1

Conceptual Framework of the Study

Using the cross-sectional approach to this research, this study assumed the analysis of parametric data. The first stage of data analysis was to assess the data set for assumptions of parametric characteristics. These analyses included common descriptive statistics such as mean, median, standard deviation, skewness, and kurtosis. The five percent trimmed mean was also calculated to explore the impact of extreme cases or outliers. Kolmogorov-Smirnov statistics were used to assess normality. Finally, histograms were generated to visually assess the normality of the data sets.

The analyses of two data sets (combined independent variables and dependent variable) align to the first and second research questions of this study. For Research

Question One, a correlation was analyzed to assess the relationship between each individual sociopolitical factor and the dependent variable of adult participation. For Research Question Two, a relationship was analyzed to assess the collective influence multiple sociopolitical factors (independent variables) may have on the dependent variable of adult participation. From these analyses, this study identified which and what combination of selected state sociopolitical factors had the strongest relationships with the dependent variable of adult participation. For Research Question Three, a visual comparison of descriptive statistics from high participation states and Montana was conducted to identify any disparity in those sociopolitical factors most influencing adult learner participation.

Two forms of multiple regression analysis were employed to examine Research Questions One and Two. According to Mertler and Vannatta (2005), “regression analysis procedures have as their primary purpose the development of an equation that can be used for predicting values on some dependent variable for all members of the population” (p. 165). Tabachnick and Fidell (2001) state “regression analyses are a set of statistical techniques that allow one to assess the relationship between one dependent variable and several independent variables” (p. 111). According to Pallant (2007) “multiple regression is based on correlation, but allows a more sophisticated exploration of the interrelationship among a set of variables” (p. 146). The ability to assess bivariate and multivariate relationships between independent and dependent variables, while exploring or controlling for potential interrelationships of independent variables, make multiple regression analysis the best statistical approach for this study.

Multiple regression combines several independent variables to understand or predict a value on a dependent variable. “The result of regression is an equation that represents the best prediction of a dependent variable from several continuous (or dichotomous) independent variables” (Tabachnick & Fidell, p. 111). Multiple regression procedures estimate a linear equation in the following form:

$$Y^l = A + B_1X_1 + B_2X_2 + \dots + B_pX_p$$

where Y^l is the predicted value of the dependent variable, A is the Y intercept, the X 's represent the various independent variables (of which there are p), and the B 's are the coefficients assigned to each of the independent variables during regression.

Data analysis for the first research question was conducted to accomplish two primary purposes. The first was “to investigate the hypothesized relationships (and direction of the relationships)” between independent and dependent variables and second “to identify the significance of the correlation coefficients,” as Jung noted (2001, p. 78). Assuming normalcy of data, standard, or simultaneous multiple regression was used to calculate the amount of variance in the dependent variable accounted for by each independent variable and the strength and direction of any relationship. Simultaneous multiple regression is one of the most common methods of multiple regression where all variables are entered into the analysis at the same time (Tabachnick & Fidell, 2001). Using a least squares fit similar to linear regression, the best linear combination of variables is determined by identifying the individual independent variables with the strongest relationship (correlation) to the dependent variable (Gliner & Morgan, 2000). The alpha level, or significance criterion, was set *a priori* at .05 for this analysis.

For the second research question, stepwise multiple regression was conducted to investigate the multivariate relationships between selected state sociopolitical factors (independent variables) and the adult participation rate (dependent variable). Stepwise multiple regression is a procedure where the equation begins empty and the researcher provides a list of independent variables and allows a computer to select which variables and in what order they will enter the equation based on a set of statistical criteria (Pallant, 2007). According to Tabachnick and Fidell (2001), stepwise multiple regression “is typically used to develop a subset of independent variables that is useful in predicting the dependent variable, and to eliminate those independent variables that do not provide additional prediction to the independent variables already in the equation” (p. 135). Stepwise procedures not only assess for the relationship between one or more independent variables and the dependent variable, but also allow for the exploration of how independent variables combine producing a greater or lesser correlation with the dependent variable (Gliner & Morgan, 2000).

Gliner and Morgan (2000) describe the stepwise process as follows:

Each phase of the procedure is called a step. At Step 0, a correlation matrix is formed among all variables including the criterion or dependent variable. At Step 1, the predictor [independent] variable that correlates the highest with the criterion variable is entered into the equation. (Note: At this step, and any following step, the size of the correlation must reach a designated significance level of the predictor variable to be entered). At Step 2, the predictor variable that adds the most new variance to the first predictor variable is entered into the equation. At Step 3, the predictor variable that adds the most to the two predictor variables already selected

is entered into the equation. This continues until either all variables are entered into the equation or significance is not reached for any of the remaining variables. (p. 297)

The alpha level, or significance criterion for the stepwise multiple regression analysis, was set *a priori* at .05.

The use of regression analysis requires that certain assumptions about the data are met. Pallant (2007) suggests generating standardized residual scatterplots to assess for outliers and violations to the necessary assumptions of normality, linearity, and homoscedasticity of the data observations. Non-linear or curvilinear relationships can either disqualify regression analysis or understate the strength of a relationship between variables. The use of multiple regression also assumes homoscedasticity where similarity of scores exists between variables. The residual scatterplot provides a visual representation of the direction of the relationships between the independent and dependent variables while also allowing the researcher to identify outliers or concerns about the homoscedasticity based on the placement of the observations on the scatterplot. This examination was conducted while running both simultaneous and stepwise multiple regression analyses.

In addition, Pallant (2007) asserts descriptive statistics can be helpful in addressing specific research questions as well as to check “variables for any violation of the assumptions underlying the statistical techniques” used to address those research questions (p. 53). Therefore, the generation of descriptive statistics for all variables and all states were conducted as the first phase in assessing for violations of the necessary assumptions of the data required by regression analysis.

Research Question Three was considered through the analyses of descriptive statistics. Upon conducting the regression analyses to answer the first two research questions, the individual, or combination of selected state sociopolitical factors most predictive of adult participation rates in public two-year colleges were identified. Next a matrix of the descriptive statistics for the high participation states and Montana was compiled for visual comparison.

Figure 2 illustrates the models for conducting simultaneous and stepwise multiple regression analyses, as well as the comparison analysis of descriptive statistics.

Figure 2

Data Analysis Models

Model I: Standard (Simultaneous) Multiple Regression Analysis

Independent: Sociopolitical Factors

Dependent: Adult Participation Rate

Simultaneous Multiple Regression: Unique contribution of each independent variable in predicting the variance in the dependent variable (research question #1)

Model II: Stepwise Multiple Regression Analysis

Independent: Sociopolitical Factors

Dependent: Adult Participation Rate

Stepwise Multiple Regression: Combined effect of independent variables on the dependent variable to determine best predictive model of combined factors (research question #2)

Model III: Descriptive Statistics Analysis

Observation: Montana

Observation: High Participation States

Descriptive Statistics: Comparative analysis between Montana and high participation states of common descriptive statistics on those sociopolitical factors most predictive of the dependent variable (research question #3)

This study included eight null hypotheses. These were previously identified with the independent variables. The alpha level, or significance criterion, was set $p \leq .05$ for all null hypotheses. Stated again, the assumptions for this study will be as follows:

The first null hypothesis is:

H₀ There is no relationship between the state institutional density and the participation rate of adult learners.

The second null hypothesis is:

H₀ There is no relationship between the percent of public two-year colleges and the participation rate of adult learners.

The third null hypothesis is:

H₀ There is no relationship between the proportion of two-year colleges with open admissions and the participation rates of adult learners.

The fourth null hypothesis is:

H₀ There is no relationship between the percent of public two-year colleges offering distance learning in a state and the participation rate of adult learners.

The fifth null hypothesis is:

H₀ There is no relationship between the number of public two-year colleges in a state offering the opportunity for earning credit from prior experience and the participation rate of adult learners.

The sixth null hypothesis is:

H₀ There is no relationship between the participation rate of adult learners and the difference in average annual earnings between high school and associate degree graduates.

The seventh null hypothesis is:

H₀ There is no relationship between the participation rate of adult learners and the average costs of attendance at public two-year colleges as a percent of median household income in the state.

The eighth null hypothesis is:

H₀ There is no relationship between the level of state funded need-based financial aid and the participation of adult learners.

Summary

This chapter discussed the methodological design of the study. Using an archival research approach, this study utilized a cross-sectional sampling of statistical record data collected from nationally-vetted surveys conducted in the 2003, 2005, and 2007 calendar years. Primary data sources included governmental and non-profit organizations such as the National Center for Education Statistics, the US Census Bureau, and the National Association of State Student Grant and Aid Programs. Using simultaneous and stepwise regression analyses, data was analyzed to reveal what, if any relationship exists between the independent variables and the dependent variable of adult participation in public two-year colleges. Descriptive statistics were examined to assess for assumptions of data observations as well as to allow for comparison between Montana and high participation states that enroll the greatest percentage of adult learners in public two-year colleges. Independent variables were identified and further dissected to include their associated

hypothesis, *a priori* assumption (null hypothesis), the statistic of interest, rationale for inclusion in the study, and data sources. Finally, Chapter Three addressed specific data analysis models employed in this study.

CHAPTER FOUR

FINDINGS

Introduction

The purpose of this study was to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. Through this inquiry, the study employed a quantitative approach to identify what relationships exist between state sociopolitical factors and the rate of non-traditional, or adult, student participation in credit-bearing coursework at public two-year colleges. This chapter describes the application of statistical treatments to the data, the results of those analyses, and summary of the results.

Preliminary Analysis

Archived statistical record data were gathered for all 50 states for the 2003, 2005, and 2007 calendar years. Using a cross-sectional sampling of three consecutive years from the census (the United States) provided 150 observations, meeting the threshold requirements for the statistical procedures utilized in this study. Pallant (2007) suggested that descriptive statistics can be helpful in checking “variables for any violation of the assumptions underlying the statistical techniques” used to address research questions (p. 53). This study used multiple regression as the primary statistical analysis. Thus, the generation of descriptive statistics for all variables, and all states, were conducted to check for violations of the necessary assumptions of the data required by regression analysis. Descriptive statistics pertaining to the dependent and eight independent variables are provided in Table 5.

Table 5
Descriptive Statistics

Statistic	PartRate	InstDens	TwoYrPercent	OpenAdmin	DistLearn
Mean	.014	.472	.267	.925	.944
Median	.013	.359	.257	1.000	1.000
Std. Deviation	.007	.303	.128	.174	.099
Minimum	.002	.039	.036	.000	.435
Maximum	.035	1.436	.700	1.000	1.000
Skewness	.985	1.391	.810	-3.335	-2.624
Kurtosis	1.008	1.593	1.168	12.554	7.435
<i>n</i>	150	150	150	150	150
Statistic	ExpLearn	EconIncent	TwoYrAfford	NeedAid	
Mean	.607	\$4,997	.052	\$1,257,543	
Median	.635	\$5,045	.049	\$1,137,630	
Std. Deviation	.269	\$1,526	.019	\$1,077,390	
Minimum	.0000	\$626	.010	\$0	
Maximum	1.000	\$9,221	.100	\$4,705,355	
Skewness	-.242	-.017	.265	1.046	
Kurtosis	-.766	.427	-.523	.846	
<i>n</i>	150	150	150	150	
PartRate: Adult Participation Rate InstDens: Institutional Density TwoYrPercent: Percent of Two-Year Colleges OpenAdmin: Percent of Open Admissions Colleges DistLearn: Prevalence of Distance Learning					
ExpLearn: Opportunity for Earning Credit for Prior Experience EconIncent: Economic Incentive of Two-Year Degree TwoYrAfford: Two-Year College Affordability NeedAid: Availability of Need-Based Aid					

Multiple regression requires parametric data. Therefore, the first stage of data analysis was to assess the data set for assumptions of parametric characteristics. These analyses included common descriptive statistics such as mean, standard deviation, skewness, and kurtosis. The five percent trimmed mean was also calculated to explore the impact of extreme cases or outliers. Kolmogorov-Smirnov and Shapiro-Wilk statistics were used to assess normality and are provided in Table 6. Finally, histograms (Figure 3) were generated to visually assess the normality of the data sets.

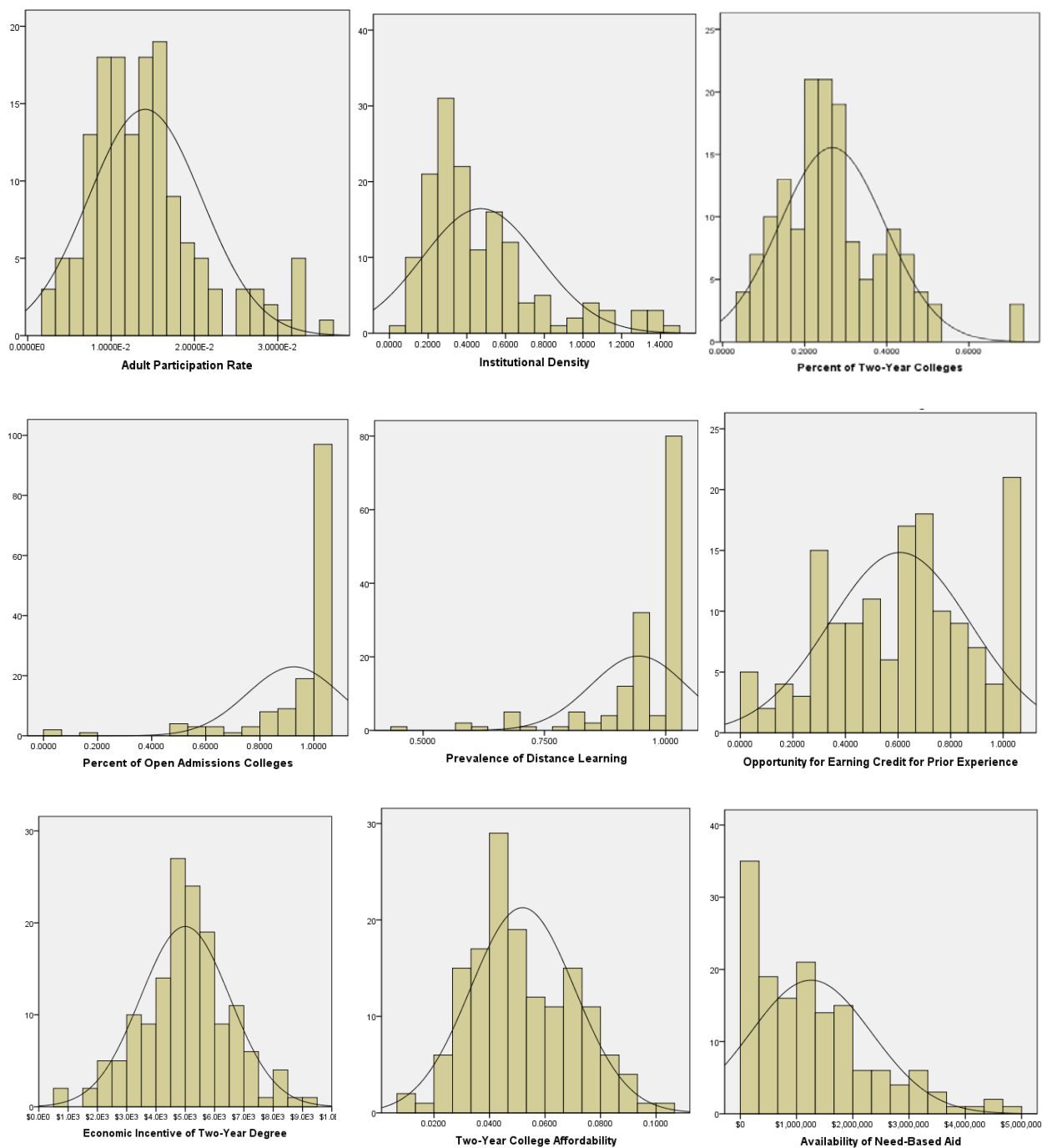
Table 6

Tests of Normality

	<u>Kolmogorov-Smirnov^a</u>			<u>Shapiro-Wilk</u>		
	Statistic	df	Sig.	Statistic	df	Sig.
Adult Participation Rate	.115	150	.000	.930	150	.000
Institutional Density	.168	150	.000	.865	150	.000
Percent of Two-Year Colleges	.121	150	.000	.953	150	.000
Percent of Open Admissions Colleges	.334	150	.000	.496	150	.000
Prevalence of Distance Learning	.285	150	.000	.621	150	.000
Opportunity for Earning Credit for Prior Experience	.072	150	.055	.959	150	.000
Economic Incentive of Two-Year Degree	.067	150	.094	.991	150	.423
Two-Year College Affordability	.090	150	.005	.981	150	.032
Availability of Need-Based Aid	.122	150	.000	.908	150	.000

a. Lilliefors Significance Correction

Figure 3

Histograms of Variable Data

Initial review of the descriptive statistics and tests of normality suggested most of the variables possessed some level of violation of the assumption of normality. Skewness and Kurtosis values identified abnormal distribution of observations to many of the variables (see Table 6), and a visual assessment of histograms confirmed this assertion (see Figure 3). Kolmogorov-Smirnov results showed significant values for all but the two variables, Opportunity to Earn Credit for Prior Experience and Economic Incentive of a Two-Year Degree. Pallant (2007) suggests that a non-significant value on the Kolmogorov-Smirnov statistic (significance value of more than .05) indicates normality. Significance values falling below .05 suggest some violation of the assumption of normality, although this can be quite common in larger sample sizes (Pallant, 2007). As a census study, collecting three years of data for each member of the population (states), this study collected what could be considered a large sample size.

Multiple regression analyses are sensitive to outliers and non-normally distributed data (Tabachnick & Fidell, 2001). Rather than removing those variables showing some violations of the assumption of normality, data transformation techniques were applied. Transformation of variables “involves mathematically modifying the scores using various formulas until the distribution looks more normal” (Pallant, 2007, p. 87). Tabachnick and Fidell (2001) illustrated the most common problems associated with non-normally distributed data, and provide suggestions for the types of transformation to be applied to those data. Table 7 outlines the transformation methods used for each variable in this study, and the mathematical formula accompanying that method as suggested by Tabachnick and Fidell (2001).

Table 7

Data Transformation Methods

Variable	SPSS Variable	Method	Formula
Adult Participation Rate	PartRate	Square Root	$\text{SQRT}(\text{PartRate})$
Institutional Density	InstDens	Square Root	$\text{SQRT}(\text{InstDens})$
Percent of Two-Year Colleges	TwoYrPercent	Square Root	$\text{SQRT}(\text{TwoYrPercent})$
Percent of Open Admissions Colleges	OpenAdmin	Reflect & Inverse	$1/(\text{K}-\text{OpenAdmin})$ where $\text{K}=2$
Prevalence of Distance Learning	DistLearn	Reflect & Inverse	$1/(\text{K}-\text{DistLearn})$ where $\text{K}=2$
Two-Year College Affordability	TwoYrAfford	Square Root	$\text{SQRT}(\text{TwoYrAfford})$
Availability of Need-Based Aid	NeedAid	Square Root	$\text{SQRT}(\text{NeedAid})$

With the transformation of the variables complete, descriptive statistics were again generated to examine changes in the distribution of observations and assess for improvement in normality. Upon examination of the new Kolmogorov-Smirnov values (Table 8), three more variables, Adult Participation Rate, Two-Year College Affordability, and Availability of Need-Based Aid, had results above a significance level of .05, suggesting normality. The variable Percent of Two-Year Colleges improved considerably, although it did not reach the .05 threshold suggested by Pallent (2007). The variables of Institutional Density, Percent of Open Admissions Colleges, and Prevalence of Distance Learning had Kolmogorov-Smirnov significance values still suggesting some violation of the assumptions of normality. In examination of histograms and box plots, it appeared that outliers may have influenced normality for Institutional Density, while the Percent of Open Admissions Colleges and Prevalence of

Distance Learning appeared to be skewed because of the nature of the construct being examined. That is, the majority of the states reported having near 100 percent of their public two-year institutions with open admissions and offering distance learning. Non-normality in data distribution and skewness may result in an underestimate of the variance, although that is mitigated with larger sample sizes (Tabachnick & Fidell, 2001). Given these concerns, the variables were included in the multiple regression analyses, with note given to the potential limitations of including these variables in the model.

Table 8

Tests of Normality on Transformed Variables

	<u>Kolmogorov-Smirnov^a</u>			<u>Shapiro-Wilk</u>		
	Statistic	df	Sig.	Statistic	df	Sig.
Square Root of Adult Participation Rate	.072	150	.055	.979	150	.023
Square Root of Institutional Density	.125	150	.000	.956	150	.000
Square Root of Percent of Two-Year Colleges	.075	150	.037	.985	150	.102
Reflect and Inverse of Percent of Open Admissions Colleges	.337	150	.000	.574	150	.000
Reflect and Inverse of Prevalence of Distance Learning	.269	150	.000	.681	150	.000
Square Root of Two-Year College Affordability	.057	150	.200	.984	150	.079
Square Root of Availability of Need-Based Aid	.060	150	.200	.980	150	.030

a. Lilliefors Significance Correction

Research Question One

The first Research Question of this study was, “what is the relationship between selected state sociopolitical factors and adult participation in credit-bearing coursework at public two-year colleges?” To answer this question, and ultimately test the hypotheses within this study, a standard, or simultaneous, multiple regression was conducted to assess the ability all eight independent variables had on predicting levels of adult participation rate in public two-year colleges. Entering all independent variables simultaneously into the regression analysis allowed for examination of how each sociopolitical factor contributed to the variance in the dependent variable of adult participation.

The first step in interpreting the output from the standard multiple regression was to check the assumptions of the data necessary for the regression analysis. Preliminary analyses were conducted to ensure no violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity. Examination of the correlation matrix showed all independent variables had a significant ($p < .05$) correlation with the Adult Participation Rate, although there were varying effect sizes. The strongest relationships between independent variables and the dependent variable included the Percent of Two-Year Colleges ($r = .460$), Two-Year College Affordability ($r = -.431$), and Percent of Open Admissions Colleges ($r = .340$). Individually, these three variables have between a small and medium effect on the dependent variable. According to Cohen (1988), the general opinion is that an r value of 0.2 is indicative of a small effect, 0.5 a medium and 0.8 a large effect size. All Pearson r correlations are presented in Table 9.

Table 9

Pearson r Correlation Values Measured Against Adult Participation Rate

Variable	Pearson <i>r</i> Value	Significance
Institutional Density	.258	.001
Percent of Two-Year Colleges	.460	.000
Percent of Open Admissions Colleges	.340	.000
Prevalence of Distance Learning	.212	.005
Opportunity for Earning Credit for Prior Experience	-.267	.000
Economic Incentive of Two-Year Degree	.189	.010
Two-Year College Affordability	-.431	.000
Availability of Need Based Aid	.174	.017

Evaluation of Tolerance and Variance Inflation Factor (VIF) values was conducted to assess for multicollinearity between independent variables. According to Pallent (2007), Tolerance values less than .10, or VIF values above 10, for an independent variable, may suggest multiple correlations with other variables, indicating multicollinearity. For this study, all independent variables produced Tolerance values greater than .10 and VIF values below 10, mitigating the concern of multicollinearity. Table 10 lists the VIF and Tolerance values for all independent variables.

Table 10

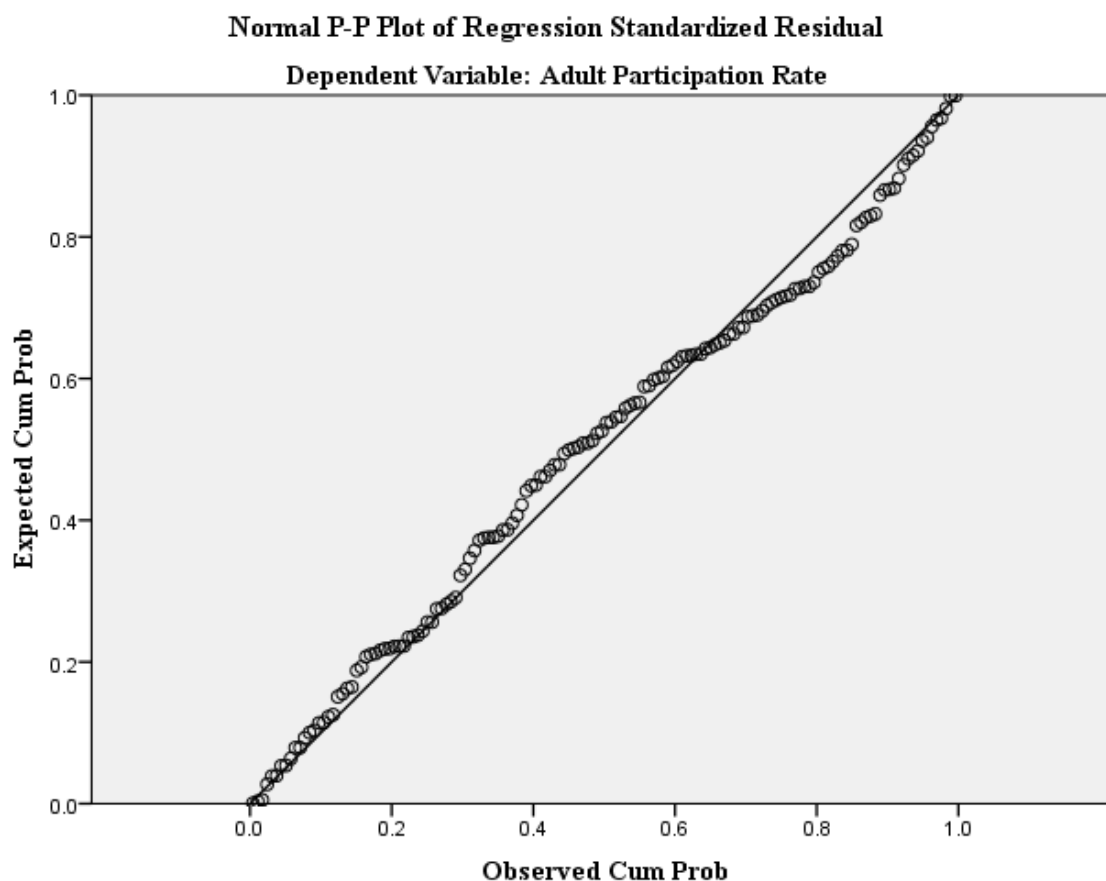
Collinearity Statistics

Variable	Tolerance	VIF
Institutional Density	.164	6.080
Percent of Two-Year Colleges	.172	5.824
Percent of Open Admissions Colleges	.792	1.262
Prevalence of Distance Learning	.732	1.367
Opportunity for Earning Credit for Prior Experience	.454	2.202
Economic Incentive of Two-Year Degree	.545	1.836
Two-Year College Affordability	.490	2.040
Availability of Need Based Aid	.606	1.651

The last component of step one in the multiple regression analysis was to generate Normal Probability Plot (P-P) of the Regression Standardized Residual and a Scatterplot to assess for the assumptions of normality, linearity, homoscedasticity, and the independence of residuals. The Normal P-P Plot is listed as Figure 4. Pallant (2007) stated “you are hoping that your points will lie in a reasonably straight diagonal line from the bottom left to the top right” (p. 156). The Normal P-P Plot suggests no major deviation from normality.

Figure 4

Normal Probability Plot of Regression Standardized Residual



Mahalanobis distance statistics were also generated for each observation to test for the impact of outliers on the regression model. Mahalanobis distance is a measure used to identify the similarity of a data set through the examination of distances between each observation and means of a sample (Tabachnick & Fidell, 2001). Tabachnick and Fidell suggested that the critical Mahalanobis value for eight independent variables is 26.13. No cases in this study's observations exceeded this critical value on the Mahalanobis distance statistics, suggesting no major impact from outliers on the regression model. Overall analysis of these three methods provided assurance that no major violations of assumptions occurred in the sample.

The second step in interpreting the output from the standard multiple regression was to evaluate the model generated as a result of the regression analysis. With the entry of all eight independent variables as the first and only step in the regression analysis, the total variance in Adult Participation Rate explained by the model was 50.3%, $F(8, 141) = 17.85$, $p < .0005$. Evaluation of the ANOVA results of the standard multiple regression suggest the model for this analysis reached statistical significance ($p < .0005$). The regression model summary is presented as Table 11 and the ANOVA results are presented in Table 12.

Table 11

Standard Multiple Regression Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.709 ^a	.503	.475	.021

a. Predictors: (Constant), Availability of Need Based Aid, Two-Year College Affordability, Prevalence of Distance Learning, Percent of Open Admissions Colleges, Percent of Two-Year Colleges, Economic Incentive of Two-Year Degree, Opportunity for Earning Credit for Prior Experience, Institutional Density

b. Dependent Variable: Adult Participation Rate

Table 12

ANOVA Results of Standard Multiple Regression Model^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.061	8	.008	17.850	.000 ^a
	Residual	.060	141	.000		
	Total	.120	149			

a. Predictors: (Constant), Availability of Need Based Aid, Two-Year College Affordability, Prevalence of Distance Learning, Percent of Open Admissions Colleges, Percent of Two-Year Colleges, Economic Incentive of Two-Year Degree, Opportunity for Earning Credit for Prior Experience, Institutional Density

b. Dependent Variable: Adult Participation Rate

The final stage in the process of interpreting the results of the standard multiple regression was to determine which of the independent variables in the model contributed to the prediction of the dependent variable, and to what extent. To make this assessment, an evaluation of the standardized coefficients (Beta) was conducted to ascertain which variables in the model contribute to the prediction of the dependent variable.

Examination of semipartial correlation coefficients was conducted to determine the percent of variance accounted for by each variable contributing in the model. Table 13 contains the coefficient statistics for the standard multiple regression for variables predicting Adult Participation Rate.

Table 13

Summary of Standard Multiple Regression for Variables Predicting Adult Participation Rate

	B	Std. Error	Beta	t	Sig.	Correlations		
						Zero-order	Partial	Part
(Constant)	.009	.034		.265	.791			
Institutional Density	.006	.020	.043	.294	.769	.258	.025	.017
Percent of Two-Year Colleges	.097	.032	.430	2.999	.003	.460	.245	.178
Percent of Open Admissions Colleges	.022	.018	.082	1.235	.219	.340	.103	.073
Prevalence of Distance Learning	.081	.027	.208	3.000	.003	.212	.245	.178
Opportunity for Earning Credit for Prior Experience	-.006	.009	-.061	-.696	.488	-.267	-.058	-.041
Economic Incentive of Two-Year Degree	.000	.000	-.075	-.938	.350	.189	-.079	-.056
Two-Year College Affordability	-.240	.057	-.358	-4.224	.000	-.431	-.335	-.251
Availability of Need-Based Aid	.000	.000	.379	4.965	.000	.174	.386	.295

In this regression model, four independent variables were statistically significant. Percent of Two-Year Colleges had the highest Beta value (Beta = .430, $p \leq .003$), followed by Availability of Need-Based Aid (Beta = .379, $p \leq .0005$), then Two-Year College Affordability (Beta = -.358, $p \leq .0005$), and last was Prevalence of Distance Learning (Beta = .208, $p \leq .003$). Squaring the semipartial correlation coefficients (Part), the model suggests Availability of Need-Based aid accounted for 9 percent of the total variance of Adult Participation Rate in the model (.295²), Two-year College Affordability 6 percent (-.251²), Prevalence of Distance Learning and Percent of Two-Year Colleges each contributing 3 percent (.178²).

This study included eight null hypotheses. The alpha level, or significance criterion, was set $p \leq .05$ for all null hypotheses. The first null hypothesis stated there is no relationship between the state institutional density and the participation rate of adult learners. In the standard multiple regression, the institutional density was not found to be a significant predictor of the adult participation rate (Beta = .043, $p \geq .769$). Therefore, this study failed to reject the first null hypothesis.

The second null hypothesis stated there is no relationship between the percent of public two-year colleges and the participation rate of adult learners. The percent of public two-year colleges was shown to be tied for the third largest significant predictor of the adult participation rate (Beta = .430, $p \leq .003$). Therefore, the second null hypothesis was rejected.

The third null hypothesis stated there is no relationship between the proportion of two-year colleges with open admissions and the participation rates of adult learners. The percent of open admissions colleges was not found to be a significant predictor of the adult participation rate (Beta = .082, $p \geq .219$). Therefore, this study failed to reject the third null hypothesis.

The fourth null hypothesis stated there is no relationship between the percent of public two-year colleges offering distance learning in a state and the participation rate of adult learners. The prevalence of distance learning was found to be tied for the third largest significant predictor of the adult participation rate (Beta = .208, $p \leq .003$). Therefore, the fourth null hypothesis was rejected.

The fifth null hypothesis stated there is no relationship between the number of public two-year colleges in a state offering the opportunity for earning credit from prior

experience and the participation rate of adult learners. The opportunity for earning credit from prior experience was not found to be a significant predictor of the adult participation rate (Beta = $-.061$, $p \geq .488$). Thus, this study failed to reject the fifth null hypothesis.

The sixth null hypothesis stated there is no relationship between the participation rate of adult learners and the difference in average annual earnings between high school and associate degree graduates. The difference in average annual earnings between high school and associate degree graduates was not found to be a significant predictor of the adult participation rate (Beta = $-.075$, $p \geq .350$). Therefore, this study failed to reject the sixth null hypothesis.

The seventh null hypothesis stated there is no relationship between the participation rate of adult learners and the average costs of attendance at public two-year colleges as a percent of median household income in the state. The average cost of attendance at public two-year colleges as a percent of median household income was found to be the second largest significant predictor of the adult participation rate (Beta = $-.358$, $p \leq .0005$). Therefore, the seventh null hypothesis was rejected.

The eighth null hypothesis stated there is no relationship between the level of state funded need-based financial aid and the participation of adult learners. The level of state funded need-based financial aid was found to be the largest significant predictor of the adult participation rate (Beta = $.379$, $p \leq .0005$). Thus, the eighth null hypothesis was rejected.

Research Question Two

The second Research Question was “what combination of selected state sociopolitical factors are the most predictive of the adult participation in credit-bearing coursework at public two-year colleges?” For this question, stepwise multiple regression

was used to assess which combination of independent variables had the greatest ability to predict Adult Participation Rate. The stepwise method was employed to derive the most parsimonious model possible because the fewest independent variables are included in the model. Summary tables of the multiple regression results are included in this section to aid in the discussion of the statistical analyses. Analyses to test for violation of the assumptions of normality, linearity, multicollinearity, and homoscedasticity were conducted and reported under Research Question One and its accompanying standard multiple regression results. Those assumptions are carried through the stepwise multiple regression analysis.

The stepwise regression models summary are presented as Table 14 and the ANOVA results are presented in Table 15. Table 16 contains the coefficient statistics for the stepwise multiple regression for variables predicting Adult Participation Rate.

Table 14

Stepwise Multiple Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1 ^a	.460 ^a	.211	.206	.025
2 ^b	.580 ^b	.337	.328	.023
3 ^c	.680 ^c	.463	.452	.021
4 ^d	.699 ^d	.489	.475	.020

a. Predictors: (Constant), Percent of Two-Year Colleges

b. Predictors: (Constant), Percent of Two-Year Colleges, Availability of Need Based Aid

c. Predictors: (Constant), Percent of Two-Year Colleges, Availability of Need Based Aid, Two-Year College Affordability

d. Predictors: (Constant), Percent of Two-Year Colleges, Availability of Need Based Aid, Two-Year College Affordability, Prevalence of Distance Learning

Table 15

ANOVA Results of Stepwise Multiple Regression Models

Model		Sum of Squares	df	Mean Square	F	Sig.
1 ^a	Regression	.025	1	.025	39.662	.000 ^a
	Residual	.095	148	.001		
	Total	.120	149			
2 ^b	Regression	.040	2	.020	37.313	.000 ^b
	Residual	.080	147	.001		
	Total	.120	149			
3 ^c	Regression	.056	3	.019	41.944	.000 ^c
	Residual	.065	146	.000		
	Total	.120	149			
4 ^d	Regression	.059	4	.015	34.685	.000 ^d
	Residual	.061	145	.000		
	Total	.120	149			

a. Predictors: (Constant), Percent of Two-Year Colleges

b. Predictors: (Constant), Percent of Two-Year Colleges, Availability of Need Based Aid

c. Predictors: (Constant), Percent of Two-Year Colleges, Availability of Need Based Aid, Two-Year College Affordability

d. Predictors: (Constant), Percent of Two-Year Colleges, Availability of Need Based Aid, Two-Year College Affordability, Prevalence of Distance Learning

Table 16

*Summary of Stepwise Multiple Regression for Variables Predicting Adult**Participation Rate*

Model 4	B	Std. Error	Beta	t	Sig.	Correlations		
						Zero-order	Partial	Part
(Constant)	.027	.028		.968	.335			
Percent of Two-Year Colleges	.116	.015	.515	7.886	.000	.460	.548	.468
Availability of Need-Based Aid	.000	.000	.372	5.657	.000	.174	.425	.336
Two-Year College Affordability	-.235	.042	-.352	-5.607	.000	-.431	-.422	-.333
Prevalence of Distance Learning	.066	.024	.170	2.720	.007	.212	.220	.161

The stepwise method was employed to determine which independent variables are selected in the model for entry or removal. The independent variable with the strongest, significant correlation with the dependent variable was entered into the model first. As the variable with the strongest, significant contribution ($\text{Beta} = .515, p \leq .0005$) to the variance of the dependent variable, Percent of Two-Year Colleges was entered first into the model, while all other variables were removed. Independently, the Percent of Two-Year Colleges variable accounted for slightly over 21 percent ($R^2 = .211$) of the variance in Adult Participation Rate in Model 1.

The stepwise method entered the Availability of Need-Based Aid into the second prediction model, as the next independent variable with significant contribution ($p \leq .0005$) to the variance of the dependent variable and the second highest partial correlation ($\text{Beta} .372$), after controlling for the first independent variable. Availability of Need-Based Aid accounted for an additional 13 percent of the variance in Adult Participation Rate in Model 2 ($R^2 = .337$).

The stepwise method entered Two-Year College Affordability into the third prediction model as the next independent variable with significant contribution ($p \leq .0005$) to the variance of the dependent variable and the third highest partial correlation ($\text{Beta} = -.352$) on Adult Participation Rate, after controlling for the previous two independent variables. Two-Year College Affordability accounted for an additional 12 percent of the variance in Adult Participation Rate in Model 3 ($R^2 = .463$). This variable was consistently negatively correlated to the dependent variable.

The stepwise method entered Prevalence of Distance Learning into the fourth prediction model as the last independent variable with significant contribution ($p \leq .007$) to

the variance of the dependent variable and the fourth highest partial correlation (Beta = .170), after controlling for the previous three independent variables. The Prevalence of Distance Learning accounted for an additional three percent of variance in Model 4 ($R^2 = .489$).

Results from the final stepwise regression showed that Percent of Two-Year Colleges, Availability of Need-Based Aid, Two-Year College Affordability, and Prevalence of Distance Learning revealed a significant contribution to Model 4 on the Adult Participation Rate, $F(4, 145) = 34.69, p \leq .0005$. Model 4 accounted for slightly under 49% ($R^2 = .489$) of the variance and demonstrated a strong correlation coefficient value, $R = .699$. The results show that Percent of Two-Year Colleges had a statistically significant positive effect on Adult Participation Rate, (Beta = .515 $p \leq .0005$). Availability of Need-Based Aid had a statistically significant positive effect on Adult Participation Rate, (Beta = .372, $p \leq .0005$). Two-Year College Affordability had a statistically significant negative effect on Adult Participation Rate, (Beta = -.352, $p \leq .0005$), and Prevalence of Distance Learning had a statistically significant positive effect on Adult Participation Rate, (Beta = .170, $p < .07$). The remaining variables did not make significant contributions to the variance of Adult Participation Rate and therefore did not meet the statistical criteria for entry into the regression model.

Research Question Three

The third Research Question was “do the selected state sociopolitical factors with the strongest relationship to adult participation differ between Montana and those states enrolling the most adult students in public two-year colleges?” For this question, a comparison of descriptive statistics from high participation states and Montana was

conducted to identify disparity in those sociopolitical factors most influencing adult learner participation.

Both regression analyses in this study identified the individual, and combination of, selected state sociopolitical factors most predictive of adult participation rates in public two-year colleges. According to Pallant (2007), the squared values of the semipartial correlation coefficients provide an indication of “how much of the total variance in the dependent variable is uniquely explained by that variable” (p. 159). In other words, for this study the semipartial correlation coefficients, once squared, suggest how much of a unique effect each sociopolitical factor (independent variable) has on the variance in the rate of adult participation (dependent variable).

Table 17 lists the squared values of the semipartial correlation coefficients from both regression models. Interpreting the stepwise regression model’s output, the variables are listed with in order with those having the greatest effect on the adult participation rate. These variables were the Percent of Two-Year Colleges, the Availability of Need-Based Aid, Two-Year College Affordability, and the Prevalence of Distance Learning.

Table 17

Squared Value of Semipartial Correlation Coefficients by Model

Variable	Stepwise Regression	Standard Regression
Percent of Two-Year Colleges	.22	.03
Availability of Need-Based Aid	.11	.09
Two-Year College Affordability	.11	.06
Prevalence of Distance Learning	.03	.03

To answer Research Question Three, the identification of the high participation states on the Adult Participation Rate was required. High participation states encompassed the top 16 percent (or 24 cases) of the state observations, representing those cases two and three standard deviations above the mean (see Table 18). None of Montana's three observations ranked within the top 16 percent, or high participation status. Respectively, Montana ranked 116 (MT03, Adult Participation Rate = 9 percent), 124 (MT05, Adult Participation Rate = 8 percent), and 133 (MT07, Adult Participation Rate = 7 percent). Table 19 provides a comparison of descriptive statistics between high participation states and Montana on the four independent variables most predictive of the variance in the adult participation rate.

Table 18

High Participation States

Rank	State/Year	Rank	State/Year	Rank	State/Year	Rank	State/Year
1	NM03	7	CA05	13	WA05	19	OR03
2	CA03	8	AZ05	14	IL03	20	NC05
3	NM07	9	WY03	15	AZ07	21	WA07
4	CA07	10	WA03	16	IL05	22	NV03
5	NM05	11	WY05	17	NC03	23	WI03
6	AZ03	12	WY07	18	IL07	24	KS03

Table 19

Comparison of High Participation States and Montana

Variable	Performance		Statistic	Std. Error
Percent of Two-Year Colleges	High Part States	Mean	.384	.031
		5% Trimmed Mean	.377	
		Median	.339	
		Std. Deviation	.154	
	Montana	Mean	.500	
		Median	.500	
Availability of Need-Based Aid	High Part States	Mean	\$1,351,703	\$221,242
		5% Trimmed Mean	\$1,326,873	
		Median	\$1,272,782	
		Std. Deviation	\$1,083,862	
	Montana	Mean	\$378,281	
		Median	\$394,114	
Two-Year College Affordability	High Part States	Mean	.035	.003
		5% Trimmed Mean	.035	
		Median	.034	
		Std. Deviation	.013	
	Montana	Mean	.068	
		Median	.069	
Prevalence of Distance Learning	High Part States	Mean	.968	.009
		5% Trimmed Mean	.972	
		Median	1.000	
		Std. Deviation	.043	
	Montana	Mean	.830	
		Median	.830	

Summary

This purpose of this chapter was to present the findings of the investigation of the relationships between selected state sociopolitical factors and the rate of adult participation in public two-year colleges. This chapter described statistical treatments to the data, and the results of those analyses. Preliminary analyses were conducted to assess for violation of the assumption of normality, linearity, multicollinearity, and homoscedasticity. Seven of the nine variables in the study produced results on the analyses suggesting some violation of these assumptions. Data transformation techniques were employed to address these violations.

For Research Question One, standard multiple regression was used to assess the ability of the eight independent variables to predict levels of adult participation in public two-year colleges. The total variance in Adult Participation Rate explained by the model was 50.3%, $F(8, 141) = 17.85, p \leq .0005$. The model for this analysis reached statistical significance ($p \leq .0005$). In this regression model, four independent variables produced statistically significant relationships with the dependent variable. Percent of Two-Year Colleges had the highest Beta value (Beta = .430, $p \leq .003$), followed by Availability of Need-Based Aid (Beta = .379, $p \leq .0005$), then Two-Year College Affordability (Beta = -.358, $p \leq .0005$), and finally Prevalence of Distance Learning (beta = .208, $p \leq .003$).

For Research Question Two, stepwise multiple regression was used to assess which combination of independent variables had the greatest ability to predict Adult Participation Rate. Results showed that Percent of Two-Year Colleges, Availability of Need-Based Aid, Two-Year College Affordability, and Prevalence of Distance Learning revealed a significant contribution to Model 4 on the Adult Participation Rate, $F(4, 145)$

= 34.69, $p \leq .0005$. Model 4 accounted for slightly under 49% ($R^2 = .489$) of the variance and demonstrated a strong correlation coefficient value, $R = .699$.

Research Question Three was answered through the comparison of Montana's observations to those of high participation states on the four independent variables most predictive of adult participation in public two-year colleges. High participation states encompassed the top 16 percent of the state observations, representing those cases two and three standard deviations above the mean. Montana scored better than the average of high participation states on only one variable, the Percent of Two-Year Colleges. Comparison of the other variables (Availability of Need-Based Aid, Two-Year College Affordability, and Prevalence of Distance Learning) showed Montana produced results below the average of the high participation states.

Chapter Five will present a more detailed discussion of the results of this study, its implications and recommendations for theory and practice of various constituencies, as well as providing suggestions for future research that could potentially expand the literature in the area of sociopolitical factors influencing adult participation in public two-year institutions.

CHAPTER FIVE

CONCLUSION

Introduction

The purpose of this study was to determine to what extent selected state sociopolitical factors relate to adult participation in public two-year colleges and to assess how Montana compares to those states enrolling the most adult students. Examining three different research questions, the study employed a quantitative approach to identify: (a) what relationships exist between state sociopolitical factors and the rate of non-traditional student participation in credit-bearing coursework at public two-year colleges, (b) which factors seemed most predictive of adult participation; and (c) how Montana compares with those states enrolling the most adult students. This chapter presents a detailed discussion of the results of this study, its implications, and recommendations for theory and practice of various constituencies, as well as providing suggestions for future research to expand the literature in this area.

The Research Questions

Research Question One asked, “what is the relationship between selected state sociopolitical factors and adult participation in credit-bearing coursework at public two-year colleges?” Although all selected state sociopolitical factors (independent variables) in this study illustrated a significant relationship with the participation rate of adults (dependent variable), Research Question One sought to identify the sociopolitical factors that individually contributed significantly to the variance in the adult participation rates. The four state sociopolitical factors that met this threshold were, (a) the number of two-year colleges as a percent of all institutions of higher education in each state, (b) the

availability of need-based financial aid, (c) public two-year college affordability, and (d) the prevalence of distance learning opportunities.

Research Question Two asked, “what combination of selected state sociopolitical factors are the most predictive of the adult participation in credit-bearing coursework at public two-year colleges?” Similar to Research Question One, Research Question Two sought to identify what state sociopolitical factors made significant contributions to the variance of the adult participation rate. However, this research question explored the combined influence of sociopolitical factors on adult participation, rather than individual influence. The same four sociopolitical factors were found to be the most influential in the variance of adult participation; (a) the percent of public-two year colleges, (b) the availability of need-based financial aid, (c) two-year college affordability, and (d) the prevalence of distance learning. Exploring the results of the combined influence of these factors, though, illustrated that in tandem, they accounted for over twice the variance in adult participation than each factor considered independently (21% for all four factors in the standard regression results versus 47% for the four factors in the stepwise regression results), suggesting a multiplier effect when these factors exist simultaneously.

Research Question 3 asked, “do the selected state sociopolitical factors with the strongest relationship to adult participation differ between Montana and those states enrolling the most adult students in public two-year colleges?” When comparing scores between Montana and the high participation states, Montana scored above the mean of high participation states on only one factor, the number of public two-year colleges as a percent of all institutions of higher education in the state. On the three other factors (availability of need-based financial aid, two-year college affordability, and the

prevalence of distance learning), Montana scored considerably below the high participation states.

Findings and Implications

This study examined the individual, and collective, relationships of eight different sociopolitical factors (independent variables) on the phenomenon of adult participation at public two-year colleges (dependent variable). Two forms of multiple regression analyses were employed to explore these relationships. Standard multiple regression allowed for the examination of the relationship all eight sociopolitical factors' had with the adult participation rate when all factors were entered simultaneously. Stepwise multiple regression was employed to examine the relationship and predictive nature of only those factors that met statistical criteria for entry into a model based on their collective predictability on the adult participation rate.

In general, the results of both the standard and stepwise multiple regressions produced similar outcomes. They identified four sociopolitical factors that, individually and collectively, had significant, predictive ability on the variance in adult participation. These factors included; (a) the number of public two-year colleges as a percent of all institutions of higher education in the state, (b) the total state funded need-based financial aid in the state per 100,000 people, (c) the cost for attendance in public two-year colleges measured as the average annual tuition and fees as a percent of the median household income in the state, and (d) the number of public two-year colleges that offer distance education. Although the other factors did not contribute significantly in predicting adult participation in the regression models, all factors did show statistically significant relationships with the adult participation rate (using the Pearson's r values), which one

would expect in a census study. In other words, the probability the results of the analyses would be found in the entire population should be very high because you are including every member of the population in a census. However, when considering the Pearson r values, only the four factors identified previously had meaningful effect sizes. Often what research doesn't find can be as useful as what it does (Sproull, 2004). Thus, this chapter discusses all outcomes in this study. Therefore, the remainder of this chapter will explore the interpretations of outcomes for all areas of investigation in this study.

Influence of Local Two-Year Colleges

This study found that when states have a larger percent of their institutions of higher education that are public two-year colleges, the percent of adults enrolled in public two-year colleges increases. The stepwise multiple regression model found this to be the most significant factor in the model, accounting for 21% of the variance in the adult participation rate. This finding may not be surprising, but does illustrate a state-level sociopolitical statement of the philosophy driving the provision of higher education opportunities. For example, Wyoming, the state with the highest percent of public two-year colleges (70 percent), has only one public four-year university and a network of seven multi-campus community colleges. Thus, it also may not be surprising to find all three of Wyoming's observations, 2003, 2005, and 2007, were included in the 24 high participation state observations in this study.

This study did not find that the total number of public two-year colleges in the state per 100,000 people had any significant relationship with the adult participation rate. This may be for a variety of reasons, the most likely being that, unless states have made a

policy decision to skew the proportion of public two-year colleges in the state, the opportunity for adults to enroll in other institution types may be just as great.

Influence of Open Admission Policy

The percent of public two-year colleges with open admissions policies did not prove to be a significant predictor of the variance in adult participation. Two things may be considerations for this finding. First, the state observations suggested the vast majority of public two-year colleges have open admissions policies (mean = 93%). This produced little variability and also provided skewed data even after transformation. Second, as identified as a limitation to this variable, the measure of open admissions may be weak. Simply having a policy in place and the way it is implemented may be very different at each institution. It may be worthwhile to conduct further research specifically designed to explore this construct.

Influence of Distance Learning

This study found that when states have a higher percent of public two-year colleges that offer distance education, the percent of adults participating in public two-year colleges increases. The stepwise multiple regression model found this to be the weakest, significant contributing factor in the model, accounting for 3% of the variance in the adult participation rate and with the lowest correlation coefficient (Beta = .170).

Although this study found distance learning to be contributor to the prediction of adult participation, these results should be considered with some caution. Other research has clearly illustrated how flexibility in offerings and distance learning entice adult participation (Allen & Seaman, 2007; Cross K. P., 1981; Schuetze & Slowey, 2000). This study explored that belief using a national data set. However, those data may have

two major limitations. As stated earlier, the measure of distance learning is relatively weak in that it lumps all institutions into one of two categories; the institution offers courses via distance learning or it does not. The level of distance learning though could vary considerably, from a campus that offers only one course to another that has entire program offerings online. This study did not account for that variance.

The second limitation to these data is that the state observations suggested the vast majority of public two-year colleges offer courses via distance learning (mean = 94%). This produced little variability and also provided skewed data even after transformation. However, even with the cautions, the findings are promising and worthy of further exploration through additional research.

Influence of the Opportunity to Earn Credit for Prior Experience

The percent of public two-year colleges in a state that offer students the opportunity to earn college credit for prior life experience was not found to be a predictor of the variance in the participation rate of adults. Although this variable produced data much more normally distributed than the other two IPEDS variables (Open Admissions Policy and Prevalence of Distance Learning), it shares one common limitation, in that institutions are either categorized as offering this opportunity or not. The manner in which experiential learning assessment is conducted, level of flexibility for its use, and how it is promoted, may all vary significantly between two campuses who report providing this opportunity.

One interesting product of this research was the result of the Pearson's r correlation for this variable with the rate of adult participation. The correlation coefficient reported a negative relationship, suggesting as the opportunity to earn credit for prior experience

increases, the actual adult participation rate decreases. The relationship reached statistical significance ($p < .001$), however, the overall effect size was low ($r = -.268$). Because the variable did not make a significant contribution in either regression model, it may be a result of weak data rather than true correlation. Regardless, further research into this phenomenon may be of value to the body of literature.

The Economic Incentive of a Two-Year Degree

Many researchers have suggested the economic incentive of earning a college credential, or rather the ability to earn more money after college, is one of the major reasons adults participate in post-secondary education (Agbo, 2000; Aslanian & Brickell, 1980; Aslanian, 2001; Cross K. P., 1981). The literature show that, on average, earnings do increase with the level of educational attainment (Agbo, 2000; Day & Newburger, 2002). While this study found the Pearson's r correlation between the economic incentive of a two-year degree and the adult participation rate to be significant, ($p < .01$), the overall effect was very low ($r = .189$). Illustrating the small effect, the economic incentive from earning a two-year degree did not make a significant contribution to either regression model. Thus, this research suggests the incentive of earning more annually as a result of attaining an associate degree does not contribute to the prediction of adult participation.

This particular finding is interesting. Unlike many of the other variables in this study, the data for this variable illustrated normal distribution without transformation, and had a considerable range across states and across the different observations of individual states (min = \$626, max = \$9,221). Apart from the limitation of having to use data from early 2004, instead of 2003, due to the data collection methodology changes of the

American Community Survey, these data showed the least concern for violation of the assumptions of the statistical techniques used in the study. When taken in concert with the literature's suggestions of why adults participate in higher education and the proven return on further education, it is somewhat surprising this study did not find the difference in earnings between high school graduates and associate degree holders had any significant influence on the rate of adult participation.

The implications of this finding may be varied. It might suggest that the immediate barriers to participation such as the ability to pay for college, or time constraints, are simply too immediate to overcome, regardless of the long-term return on investment. This finding might suggest adults understand the earning potential of college credentials, but the actual difference in their earnings is not widely known enough to incent them to deal with the short-term challenges, and invest in a long-term payback.

Influence of Two-Year College Affordability

This study found when the average annual tuition and fees for attending a public two-year college consumes a greater percentage of a household's income, the adult participation rate decreases. The stepwise multiple regression found that two-year college affordability, or the average annual tuition and fees as a percent of median household income, was the third most significant variable in predicting the adult participation rate. The model suggests this variable accounted for 11 percent of the variance in the adult participation rate in this study.

These findings corroborate those of other studies such as Bishop's and Van Dyk's (1977) seminal work on the impact of cost on attendance. Those studies suggested that groups most commonly served at public two-year college, such as adults and minorities,

were more sensitive to increases in the cost of attendance. Similarly, this study suggests that increases in the amount of money a family needs to dedicate to paying for attendance at a public two-year college the less likely the adults in the family are to actually enroll.

New Hampshire had the highest observation on this variable. All three of the state's observation years were included in the highest values on Two-Year College Affordability, with the average annual tuition and fees as much as 10 percent of the median household income (NH05 = 10 percent, NH07 = 9.5 percent, and NH03 = 8.9 percent). Not surprisingly, New Hampshire was among the lowest performing states in this study for the rate of adult participation, with less than 0.8 percent of the adult population participating in public two-year colleges for all three observation years. Conversely, California had the lowest scores on the percent of the median household income adults would need to commit to pay for attendance at public two-year colleges (all observations were 1 percent), and was among the high participation states for adult participation, even after the variables controlled for extreme variances in population.

Influence of the Need-Based Financial Aid

The availability of state-funded, need-based financial aid was found to considerably impact the variance in the participation rate of adults in public two-year colleges. The stepwise regression model found this variable to be the second strongest predictor of adult participation rate, although the partial correlation suggests it accounts for the same percent of variance as Two-Year College Affordability, or 11 percent. Collectively though, these two variables account for nearly one-quarter of the total variance in the adult participation rate in public two-year college.

The amount of state-funded, need-based financial aid per 100,000 people varied considerably across the states (min = \$0, max = \$4.7 million). New York had the highest amount of state-funded, need-based financial aid, for all three of the state's observation years (NY05 = \$4.7 million, NY03 = 4.6 million, and NY07 = \$4.2 million). Yet the state was actually considered average performing on the adult participation rates for one year, and low performing for the other two. Exploring this further, the data from this study showed New York to be relatively low scoring in the other variables found to be significant predictors of adult participation, illustrating the power of the stepwise model in predicting adult participation versus using individual predictors.

All three observation years for South Dakota were posted the lowest scores on this variable, with the state investing nothing (\$0) in need-based financial aid. Alaska's 2003 observation also showed no investment in state-funded, need-based aid, although the state invested more in 2005 and 2007 (AK05 = \$78,227 and AK07 = \$98,028). Both South Dakota and Alaska were among the lowest performing states in regards to adult participation in public two-year colleges, and both states posted low scores on one or more of the other variables found to be significant predictors of adult participation in the regression models produced by this study.

Some states invested significantly in need-based financial aid, while also keeping the average annual tuition and fees at public two-year colleges low. These included states such as Texas, California, Illinois, and North Carolina. Not surprisingly, these states also were found to be among the highest performing in this study. Most states though, appeared to have made policy decisions to either invest in need-based aid, or in

keeping tuition and fees low, but not both. Those states with the lowest participation rate of adults seemed to make significant investments in neither.

Recommendations

The recommendations section of this chapter is constructed into four broad areas. The first is recommendations for national policy makers. The second is for state education policy makers and those governing entities responsible for the management and support of higher education in each state. These would include legislative bodies, boards of trustees or regents, taxing districts, and in some cases executive branches of government. The third area of recommendations is specifically addressed to the state of Montana, albeit the target audience for these recommendations may be loosely included in the first area. Montana's recommendations are primarily intended for the state's legislative body and the Montana Board of Regents of Higher Education. The fourth area of recommendations pertains to the national organizations and federal government responsible for the coordination and administration of the research and data utilized in this study.

It is worthy of note, that by using the state as the unit of analysis, this study sought commonality in measures for the sociopolitical factors being examined in this research. Thus, this study utilized national data-sets of common measures across states. This study also assumed relative equity in the distribution of the influence of confounding variables existing in each state, which may or may not prove to be truly similar. This assumption was listed as a limitation to the study. Therefore, when considering recommendations and any subsequent implementation of them based on this research, it is critical that those using the findings of this study do not ignore the difference context in

which each state currently exists. In other words, this study minimized the consideration of each state's unique context to identify common variables and their impact on adult participation existing across all states. Thus, the following recommendations share that commonality, but need to be brought back into joint consideration with the unique state context in order to provide meaningful direction.

Recommendations for National Policy Makers

Higher education, even at the local level, is influenced by national policy and law. One need only to consider the impact the Higher Education Act of 1965, and its subsequent reauthorizations, has had on higher education in regards to student financial aid policy and support for colleges and universities. Higher education is a national agenda, and the President's American Graduation Initiative only strengthens this assertion.

The success of our nation socially and economically is contingent on the level of education our citizenry, especially our young adult population, possesses. This study found that the ability to pay for college, either through the availability of need-based financial aid or the relative cost of tuition and fees to attend a public two-year college, had a significant influence on the rate at which adults participate. Yet both of factors have been primarily the responsibility of the states themselves, who individually have limited resources and impact on the national, perhaps global, environment in which higher education exists. National policy makers have the ability to expand existing programs, such as the Pell Grant program, to increase the amount of need-based aid available to adult students. In addition, it is probably time Federal Government efforts be employed in concert with state efforts to advance higher education agendas such as

access and affordability. It is recommended that Federal agencies and politicians take the lead of many non-profit foundations, such as the Lumina Foundation for Higher Education and the Gates Foundation, to work collaboratively with states on promising strategies. This research would suggest a place to start is on need-based financial aid and the relative cost of higher education.

Recommendations for State Education Policy Makers and Governing Entities

This research found that the percent of public two-year colleges to other institutions in the state was the most significant predictor of the participation rate of adults in them. The greater that percent, then the greater the participation was in those institutions. Unfortunately, given the current economic conditions of the nation, it is highly unlikely that states will find the resources to create more public two-year colleges. Additionally, exigency of other institution types, or their conversion to public two-year colleges, may be politically difficult. Thus, for pragmatic reasons, addressing the composition of institution types in each state may not be a useful recommendation of this research. That being mentioned, a result of the current economic crisis facing the nation may force the exploration into the numbers and types of institutions a state can support. Pending the specific strategies and goals of each state, policy makers and governing entities would be wise to consider the impact of public-two year college composition and the overall state participation of adults in higher education.

If states are truly interested in increasing the participation rates of adults, especially in public two-year colleges, this research suggests a purely financial strategy may be best. A dual investment strategy, increasing the total need-based financial aid available in the state while also decreasing the annual tuition and fees required to participate in public

two-year colleges, could have significant impact on the rate at which adults participate. To accomplish this, states may need to consider redirecting the amount of merit-based financial aid towards programs designed to provide aid based on need.

The last recommendation for education policy makers and governing entities is to consider undertaking systems- or state-level initiatives that perpetuate distance learning opportunities. Although this research provides only a weak suggestion that distance learning opportunities may entice adult students to participate in public two-year colleges, when taken in concert with evidence provided by the literature and enrollment trends, it becomes difficult to argue against the impact distance learning has on participation in higher education. States would be well-served by exploring not only the ways to proliferate distance learning, but also researching and implementing quality controls and pedagogical best practices across their education systems.

Recommendations for Montana

Mentioned previously, the consideration, and any subsequent implementation of recommendations from this research, must be considered in tandem with the unique context each state currently exists in. Montana's current context differs in many ways from those states identified as high participation states in this study. For example, Montana's population is considerably lower than most other states in the nation. In addition, the state covers a large geographic area, and historically the governmental and education leaders have tried to provide access to physical institutions of higher education so they touch all corners of the state. In addition, the state is home to seven of the 31 tribal colleges currently in existence in the United States. These institutions are the domain of sovereign tribal nations, and as such exist outside of traditional governance of

public higher education. Yet the tribal institutions play a critical role in providing higher education to the individuals who live within the state's boundaries. Thus, Montana has a diverse and expansive infrastructure of higher education, one that has proven to a considerable investment for the relatively small tax base of its citizenry. All of these contextual elements cannot be overlooked with considering how Montana may utilize the findings and recommendations of this study.

This research revealed four state sociopolitical factors, when working in concert, can predict a significant portion of total adult participation in public two-year colleges. Having a greater percentage of public two-year colleges in the state's mix of higher education institutions was found to be the largest contributing sociopolitical factor in the model. Fortunately for Montana, the state ranks well above the average of the high participation states, and with 50 percent of its institutions being public two-year colleges, it ranks fourth, fifth, and sixth place in this study behind only Wyoming's three observation years. True, many of Montana's public two-year colleges are tribal colleges, which may bring their own uniqueness to the mixture of institutions. Even still, Montana is well-off in this regard, as adding more public two-year institutions, or changing existing ones to two-year's, would be a very difficult strategy for the state implement.

Montana does not measure very well in the other two most important factors, two-year college affordability and the amount of state-funded, need-based financial aid. In 2007, Montana spent just over \$4.5 million on need-based aid, ranking it 108 of 150 observations in this study on that measure. And while Montana has made slight improvements in two-year college affordability since 2003, in 2007 the average tuition and fees at the state's public two-year colleges equated to nearly 7 percent of the median

household income. By comparison, the high participation states in this study had tuition and fees at public two-year colleges averaging only 3.5 percent of the median household income, or half that of Montana. These two findings alone suggest areas for improvement in the ways Montana invests in higher education.

If the state is truly interested in increasing the percent of adults engaged in its public two-year colleges, some financial strategies should be implemented. Recognizing the current economic conditions, in addition to Montana's already low-income status with a small tax base, the likelihood of being able to significantly increase state revenues for new investments in higher education is low. Rather, the most likely avenue to implement new financial strategies would be through reallocation of existing revenues.

Reallocation, though, should be considered in ways such that the state will see an increased return on its investment, while mitigating the negative impacts that such a reallocation may have. The state's reallocation should be targeted to areas that may help existing adults in the state access high-wage, high-demand occupations within Montana, which would produce increased earnings of Montanans' and thus an increased tax base for future investments.

First, the state should find a way to fund need-based financial aid at a much higher rate than it currently does. This may require shifting focus of current programs which emphasize merit, to a focus on need. Any reallocation of resources from merit-based to need-based aid should truly be targeted at assisting those students with the greatest potential for utilizing such need to improve their social and economic standing in Montana. Second, it may also mean that the Montana Legislature, and subsequently the Montana Board of Regents, strategically invests in an expanded need-based aid program.

Again, this should be done with diligent consideration of targeting the aid towards students, or in academic areas, that will provide a return on the state's investment. Finally, key partnerships should be explored, such as with the Student Assistance Foundation and its new private entity, to use portions of student loan interest payments to seed grant programs used exclusively to support students based on financial need.

Increasing need-based financial aid should be considered as only one component of a state financial strategy for increasing adult participation in public two-year colleges. Montana should also focus on continuing to freeze tuition increases at its public two-year colleges, and even more pointed, implement measures to decrease the cost of attendance at these institutions. The likely place to begin is with the state legislature. Montana's citizen legislature is responsible for the appropriation of state tax dollars. One of the primary areas they appropriate to is higher education. The legislature should consider increased appropriations to the Montana University System with the specific purpose of "buying down" the cost of attendance at the state's public two-year colleges. Again, knowing this type of investment will likely require a reallocation of existing resources, it is recommended the legislature tie accountability to these funds in order to clarify expectations and target outcomes from the investment. For example, new state investments in public two-year colleges may be aimed only at those institutions, programmatic areas, or communities, with the greatest potential for student success in accessing high-wage, high-demand occupations within Montana.

The Montana Board of Regents of Higher Education is responsible for allocating the legislature-appropriated resources to specific institutions in the Montana University System. In addition, the Board of Regents holds the authority to establish tuition and fee

structures at each of the system's institutions. Research has found students participating in four-year colleges and universities, typically traditional age students, are less sensitive to price increases and fluctuations (Bishop & Van Dyk, 1977; Kane, 1994; Kane, 1995; Heller, 1999; Baird, 2006). Those studies, along with this one, suggest that decreases in cost encourage the more price-sensitive students, and those students who typically participate in public two-year colleges, to enroll in greater numbers. Therefore it is recommended that the Board of Regents consider tuition increases at the state's four-year institutions off-set by tuition decreases at the state's public two-year colleges, reallocating legislature-appropriated dollars as necessary. Because of the transfer mission of public two-year colleges, it is likely that an increase in participation at those colleges will ultimately result in increased participation at the public four-year colleges and universities. Similar to the legislative expectations, any reallocation by the Board of Regents should be married to targeted outcomes and overall expectations for increased performance at the public two-year colleges on these outcomes.

Finally, Montana has made considerable progress in the perpetuation of distance learning opportunities available through its various public institutions of higher education. The Board of Regents has had strategic plan elements to increase distance learning for many years, and numerous institutions in the system have followed suite. In addition, the Montana legislature has made recent investments in the system specifically targeted at increasing distance learning. Thus, the improvements in distance learning over the past decade reflect this. From 2001 to 2009, the number of students enrolling in online courses through a Montana public college or university increased 240 percent (Montana Office of the Commissioner of Higher Education, 2009). However, Montana

still falls below the national average of the percent of students in higher education who enroll in online learning, with 17 percent of that population taking an online class as compared to the national average of 20 percent (Allen & Seaman, 2010). This research found that Montana has had 83 percent of its public two-year colleges offering distance learning courses since 2003. While this measure is better than many state observations in this study, it is still below the average of high participation states (mean = 97 percent; refer to Table 18). Therefore, it is recommended that Montana continue to expand its distance learning offerings at public two-year colleges currently offering online coursework. Special attention and support should be given to assist the final 17% of institutions that do not currently offer distance learning in establishing distance learning coursework. Where possible, goals should be established to implement more programs that can be delivered completely online.

Recommendations for Entities Responsible for Data Systems and Research

The final recommendations from this research are targeted at those individuals and organizations responsible for conducting the research and managing the data systems utilized in this study. This study relied on data from three national sources: the US Census Bureau's American Community Survey, the US Department of Education's National Center for Education Statistics' Integrated Postsecondary Education System (IPEDS), and the National Association for State Student Aid Programs. The first two are governmental organizations and data sources, while the latter is a national non-profit organization. These data sources provide powerful statistics to aid in theoretical and applied research, assess changes in key facets of the nation, and guide policy decisions.

As this study demonstrated, the power of evaluating relationships between variables designed around these data sources in aggregate may be particularly useful.

In framing this research however, the myriad discrepancies in data collection methodology, timing, and storage became evident. For example, IPEDS only requires the collection of demographic data on college students in the odd years of its fall enrollment survey, yet many of the institutions reporting on that survey provide full data. For a seemingly insignificant justification, numerous years of useful data are not being collected consistently. In addition, the American Community Survey has modified its survey methodology and reports various measures on educational-related matters, but seems to do so independent of the how the US Department of Education conducts similar surveys. Thus, another recommendation of this research is to encourage key governmental and national organizations to collaborate on the development of common survey methods, measurements, and timing to allow for greater analysis of their data.

The final recommendation center on the collection of data on key areas explored within this study. The only national repository of institutional participation in distance learning, offering credit for prior experience, and even common admissions elements, is IPEDS. Yet the depth of those data is extremely shallow, in that they are a result of campuses simply reporting whether they do or do not offer these. Nowhere does there exist a comprehensive survey or collection of data on the number of online courses offered in each state, the total number of student credit hours awarded through experiential learning, or collections of specific admission standards or policies for institutions of higher education. While these data often exist within each state, they are inconsistent in their definitions, data collection, and often difficult to obtain for analysis

outside of the state's education system. Yet to qualify for forms of federal funding, such as Title IV funds, there are mandatory reporting requirements for institutions to the federal government. Therefore, the final recommendation from this study is that the federal government, in collaboration other education entities, develop a common set of measures for educational activities such as online learning, and collect relevant data on these activities for the entire nation. These may include student credit hour generation through online learning, the number of distance education courses offered, student performance in these activities, etc.

Suggestions for Further Research

As a national study, this research explored phenomenon at a macro-level. This approach resulted in a very general understanding of the relationships between state sociopolitical factors and their influence on the participation of adults in public two-year colleges. While the findings are helpful in providing recommendations as listed previously, they also offer numerous opportunities for further research and exploration of the findings in this study. Some of these areas for further research were alluded to under the recommendations section of this chapter, but suggestions will be further described in the following.

This study produced findings that helped support other research, primarily in the concepts of fiscal policy and its implications on adult participation. The study also explored some less commonly researched variables such as the influence of distance learning, open admissions, and the opportunity to earn credit from prior experience. While those concepts have been explored using surveys of individuals to assess their own admission of how those variables influence their participation, few studies have explored

how the variables actually predict participation. Although the findings of this study suggest that of those three, only online learning appears to have some significant predictability on the adult participation rate, all three variables are relatively limited because of the data themselves (limitations were described in Chapter Three). Therefore, it is suggested that additional research, most likely at the state-level due to data availability, be conducted to either support or refute the findings of this study in regards to how/if these variables influence adult participation in higher education.

The finding that states with a higher percentage of two-year colleges tend to enroll more adults in them is not surprising. This finding may simply be a function of availability, and not choice. But, proportionately, there are fewer public two-year colleges in the United States than four-year institutions (US Department of Education, 2009) and yet they tend to enroll the largest portion of adult students (Provasnik & Planty, 2008). However, this finding suggests, but cannot be proven by this study, that adults may not necessarily choose public two-year colleges if given equal opportunity to participate in other institution types. This is a construct worthy of further investigation.

Stated previously, the find that the economic incentive of a two-year degree did not have any significant predictability on adult participation was surprising. Research has suggested adults cite economic incentive as one of the primary reasons they enroll in educational activities (Cross & Zusman, 1979; Aslanian & Brickell, 1980; Aslanian, 2001). The finding in this study suggests a disconnect between what adults say influences their decision to participate and what actually does. Of course there may be other reasons for this finding, and because the economics of a college credential are often

touted as one of the primary reasons for attaining one, further research should be conducted to explore why it would or would not provide an incentive for participation.

Summary and Conclusion

This quantitative, cross-sectional study explored the influence of selected state sociopolitical factors on the participation of adults in public two-year colleges. Through the use of multiple regression analyses, the research determined four factors that are most predictive of the rate of adult participation in each state are: (a) the relative number of public two-year colleges in relation to all institutions of higher education in the state; (b) the amount of need-based financial aid available in each state; (c) the percent of a family's income needed to pay for tuition and fees at a public two-year college; and (d) the number of public two-year colleges that offer coursework through online learning.

Chapter Five concludes this research study. The findings suggest four primary results. First, states that have a higher percentage of public two-year colleges had a higher participation rate of adults in that type of institution. Second, states that invest more in programs that award financial aid based on need experienced higher rates of adult participation in public two-year colleges. Third, states where the cost of tuition and fees to attend public two-year colleges require a family to dedicate a smaller portion of their household earnings to participate had a higher rate of adult participation. Fourth, states that had a greater number of public two-year colleges offering courses through online learning witnessed a greater participation rate of adults.

As a state, Montana has a considerable number of public two-year colleges in relationship to all institutions of higher education, averaging well above the high participation states on this measure. However, Montana falls below the states enrolling

the most adults in the level of need-based financial aid available in the state, the average cost of tuition and fees in relation to the median household income, and the total number of public two-year colleges offering coursework through online learning.

Recommendations invite policy makers and governing bodies to invest in programs providing financial aid based on need, reallocating from merit-based programs as necessary. In addition, particular attention should be given to keeping tuition and fees at public two-year colleges as low of a percent of median household income as possible. This may have to be accomplished through additional state funding, changes to tuition policy of other institution types, or reallocation of existing funds. Finally, the expansion of distance learning should be promulgated and promoted as a strategy for engaging more adults in higher education, especially public two-year colleges.

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